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Wood Pulp Supplies Considered Adequate

Study of Wood Pulp Supplies By Industrial Materials Division Shows Sufficient Resources To Meet All Probable Domestic and Export Requirements — No Government-Sponsored Plants Likely.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 3, 1940—Edward R. Stettinius, Jr., in charge of the Industrial Materials Division of the National Defense Advisory Commission has announced the results of a study of wood pulp supplies in the United States, showing that the supply of pulp in this country in 1941 will be sufficient to meet the requirements of domestic consumption and probable exports. As a result, no Government-sponsored program for building new plants or curtailing use seems necessary or desirable at present. The report was prepared because of concern over a possible wood pulp shortage due to cutting off the Scandinavian supply.

Record U. S. Pulp Output Possible

The report stated, "Production of pulp by the domestic industry this year has increased sharply and may reach a record total of nearly 9,000,000 tons.

"This would almost equal consumption in 1939 and would be adequate for requirements in 1940 were it not for the increase in domestic consumption and exports. Exports from the United States this year are estimated at 400,000 tons as compared with only 140,000 tons in 1939, again due to the shutting off of European supplies. Most of these exports have been to England and Latin America. Exports of paper and paper products have also shown a sharp increase. At one period in our study shipments to foreign countries were expanding to such an extent that it seemed we might be facing a problem, but our subsequent development of facts showed that this was not serious.

"Imports from Canada have been increasing and are expected to continue at least the present rate during the balance of the year, bringing our total imports for 1940 to an estimated 1,300,000 tons.

"The increased production of pulp by the domestic industry and the expansion in imports from Canada will in 1940, in the aggregate, more than offset the decline in shipments from Sweden, Finland and Norway.

Loss of Northern Pulp Creates Problems

"The elimination of Scandinavian pulp from this market, however, is causing some problems in the industry, especially among certain paper mills which make a variety of paper products and are dependent upon certain quality grades not available domestically. Until the pulp producers have developed these special grades or the paper mills dependent upon them have adapted their products to existing supplies, some difficulties will continue. The principal problems as now indicated are in the case of special grades of unbleached sulphite and sulphate.

"Another factor augmenting our supply has been the rapid increase in the use of waste paper, especially in the manufacture of shipping containers.

"Another problem in the industry has been the rapid rise in the price of pulp, which appeared when Scandinavian supplies were being curtailed; but leaders of the industry have assured Mr. Leon Henderson, Commissioner in charge of the Price Stabilization Division of the National Defense Advisory Commission, that further advances in their prices for wood pulp would be made only as warranted by specific increases in costs."

No Government Aid Seems Necessary

The report concluded, "In view of the limited nature of the potential shortages, the increased production already reflected in present plant facilities, the industry's plans for further expansion, the increasing use of waste materials, the possibilities for substitution, and the possibility that a large amount of Scandinavian pulp may be released at the end of the war, no Government-sponsored program for building new plants or curtailing use seems necessary or desirable at present."

The report noted that leaders of the industry and their trade associations gave wholehearted cooperation and assisted in supplying information and appraisals of the situation not otherwise available. Various Government agencies also rendered assistance in obtaining the critical information promptly.

Importance of Wood Pulp for Defense

The report also pointed out the importance of wood pulp to the defense program. Wood pulp may be important in the production of smokeless powder to supplement the supply of cotton linters.

Charges Filed Against Southern Kraft Co.

Government Injunction Suit To Restrain Southern Kraft Corp. From Interstate Shipments of Paper and Pulp Filed In New York —Action Invokes So-called "Hot Goods" Clause of Fair Labor Act.

An injunction suit which seeks to permanently restrain the Southern Kraft Corporation, of 220 East 42nd street, New York, from continuing to ship in interstate commerce pulp, kraft paper, wrapping paper, and other paper products, which it is charged, are made from pulpwood cut and produced in violation of the Fair Labor Standards Act, was filed August 30, in the name of Colonel Philip B. Fleming, Administrator of the Wage and Hour Division, U. S. Department of Labor, in U. S. District Court, New York City.

This action, invoking the so-called "hot goods" clause of the Fair Labor Standards Act which forbids the shipment in interstate commerce of all goods produced in violation of the Act, represents the latest measure taken by the Wage and Hour Division in its enforcement drive to bring the entire pulpwood industry, which employs about 150,000 workers throughout the country, into full compliance with the Fair Labor Standards Act.

Corporation Named in July Indictment

The Southern Kraft Corporation, which has extensive timber lands and operates several mills in the South, is the chief operating subsidiary of the International Paper and Power Company and is listed as having assets totalling $67,418,000. It was the largest of the twelve companies named in an indictment handed up by a Federal Grand Jury in the Southern District of New York on July 5, charging the American Pulpwood Association, and twelve companies engaged in the paper industry, with conspiracy to violate the Wage and Hour Law by keeping down the wages of approximately 40,000 employees engaged in cutting pulpwood. That indictment is still pending.

In the complaint filed today in U. S. District Court by Walter C. Bryan, Regional Attorney of the Wage and Hour Division, acting for Arthur J. White, Acting Regional Director, it was charged that Southern Kraft Corporation purchases the pulpwood from which it manufactures pulp, kraft paper, paper, wrapping paper, paper board, paper bags and allied products, from persons, firms and corporations called contractors, who are allotted areas of operation by the defendant to cut pulpwood from lands and stumpage rights owned by the Southern Kraft Corporation.

The contractors, according to the complaint, also purchase pulpwood from persons, firms and corporations, who are described as producers and who have pulpwood cut from lands and stumpage rights owned by the Southern Kraft Corporation, the contractors and the producers.

Violation of Wage Law Charged

The prices paid by Southern Kraft for the pulpwood thus cut and transported to the mills of the Southern Kraft, are set by Southern Kraft, the complaint charges, and payments therefor are made on the basis of measurements made by Southern Kraft at its mills.

Beginning October 24, 1938, the effective date of the Fair Labor Standards Act, and continuously down to the present time, the contractors and producers from whom Southern Kraft purchased pulpwood, have with the knowledge of Southern Kraft, it is alleged, paid many of their employees engaged in cutting this pulpwood, wages less than the 25 cents an hour prescribed by the Fair Labor Standards Act from October 24, 1938 to October 24, 1939, and since the latter date, have paid many of them less than 30 cents an hour, the present legal minimum wage.

Complaint Specifies Alleged Violations

Also, it is charged, these contractors and producers have, to the knowledge of Southern Kraft, failed to pay their employees time and one-half overtime for all hours worked in excess of 44 and 42 hours a week, as required by the Act.

Southern Kraft Corporation, the complaint further charges, has continuously since October 24, 1938, transported, shipped, delivered and sold in interstate commerce, goods manufactured and produced from this pulpwood which it knew was cut by employees receiving wages that were a violation of the minimum wage and maximum hour provisions of the Fair Labor Standards Act.

The Wage and Hour Division, through Colonel Fleming, asks a permanent injunction to restrain the Southern Kraft Corporation from continuing to ship or sell in interstate commerce, products manufactured in violation of the Fair Labor Standards Act.

Charges Filed Against Other Companies

A similar injunction was filed by Colonel Fleming against N. E. Spessard and Sons, Richmond, Virginia, on August 30. In this complaint, which was filed in the District Court for the Eastern District of Virginia, it charged that the defendants produce pulpwood in violation of the Fair Labor Standards Act, and sell it to the West Virginia Pulp and Paper Company, which has a mill at Covington, Virginia, where it is manufactured into paper and other items for commerce. This defendant employs 500 workers, who are engaged in the cutting of pulpwood, and is one of the largest producers of pulpwood in the South. One of the partners in the firm, Rutherford H. Spessard, is president of the American Pulpwood Association of New York.

The first suit of this kind was filed against the West Virginia Pulp and Paper Company of North Charleston, South Carolina, on August 28. This company buys pulpwood, which it is charged, was produced in violation of Sections 6 and 7 of the Act and has 1600 workers engaged in the cutting of pulpwood, from which they manufacture paper, pulp, etc., at their North Charleston mill.

These actions involving the so-called "hot goods" clause of the Fair Labor Standards Act, which forbids the shipment in interstate commerce of all goods produced in violation of the Act, are a part of the Wage and Hour Division's enforcement "drive" to bring the entire pulpwood industry, employing about 150,000 workers throughout the country, into full compliance with the Fair Labor Standards Act, it was stated.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 2, 1940—Government Printing Office has received the following bids for 65,000 sheets of white sulphite manifold paper; Mudge Paper Company, 8.86 and 9.23 cents; Marquette Paper Company, 7.93 cents; Paper Corp. of U. S., 7.9 cents; Barton, Duer & Koch Paper Company, 9.35 cents; R. P. Andrews Paper Company, 9.785 cents; Whitaker Paper Company, 9.32 cents; Mathers-Lamm Paper Company, 9.38 cents; Stanford Paper Company, 9.5 cents; Walker Goulard Plehn Company, Inc., 9.4 cents; and Old Dominion Paper Company, 8.949 and 9.229 cents.

For 14,950 pounds of yellow sulphite manifold paper; Mudge Paper Company, 9.49 and 9.84 cents; Marquette Paper Company, 8.7 cents; Paper Corp. of U. S., 8.65 cents; Barton, Duer & Koch Paper Company, 10.8 cents; R. P. Andrews Paper Company, 11.33 cents; Whitaker Paper Company, 10.79 cents; Mathers-Lamm Paper Company, 9.16 cents; Walker Goulard Plehn Company, Inc., 9.09 cents; and Old Dominion Paper Company, 9.78 cents.

For 6,780 pounds of 50 per cent rag, double coated book paper; Marquette Paper Company, 14.78 cents; Mathers-Lamm Paper Company, 14.85 cents; Barton, Duer & Koch Paper Company, 14.65 cents; and Stanford Paper Company, 14.18 and 14.33 cents.

For 57.859 pounds of 25 per cent rag, buff, blue and white ledger paper; Paper Corp. of U. S., 10.5, 12 and 9.8 cents; R. P. Andrews Paper Company, 9.84, 11.46 and 10.64 cents; Barton, Duer & Koch Paper Company, 10.45, 12, and 10.35 cents; Mudge Paper Company, 8.79, 8.79, and 8.89 cents; Mathers-Lamm Paper Company, 10.74, 11, and 10 cents; and Cauthorne Paper Company, Inc., 12.17, 12.17 and 12.17 cents.

Pacific Mills Revamp Offices

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., August 28, 1940—Pacific Mills Ltd. have now completely revamped their offices and entirely refurnished them. Modern, streamlined desks have been installed the tops of which all have rounded edges and are covered by dark green battleship linoleum cemented on. A number of the desks have side-opening typewriter compartments and the desk drawers operate on ball bearing cradle suspension slides.

As a departure from the orthodox, so prevalent in modern design, all desks, chairs and files in this office are finished in "Neutratone Gray" enamel, a warm harmonizing gray, having a minimum glare and light absorption.

The board room and vice president's office are furnished with Office Specialty De Luxe Westminster walnut suites, whose beauty is enhanced by the harmonizing colors of the drapes, and Broadloom carpets on which they are set.

Transparent Cellulose Firms Must Desist

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 4, 1940—Nine members of the transparent materials converting industry and their trade association have been ordered by the Federal Trade Commission to cease and desist from agreeing to maintain uniform prices of transparent cellulose sheets and rolls such as cellophane, sylphrap, kodapak and protectoid. The manufacturer-members are dominant factors in their industry, controlling more than 90 per cent of the country's output and sale of such products.

The respondents are National Converters Institute, 111 West Washington street, Chicago, the trade association; Shellmar Products Company, Mount Vernon, Ohio; Millprint Products Corporation (now Millprint, Inc.), 431 West Florida street, Milwaukee, with branch factories in Philadelphia and Los Angeles; Traver Paper Corporation, 358 West Ontario street, Chicago; Dobeckmun Company, 3301 Monroe avenue, Cleveland; Dennison Manufacturing Company, Framingham, Mass.; Caton Printing Company, 422 West 8th street, Kansas City, Mo.; Thomas M. Royal & Co., 5800 North Seventh street, Philadelphia; Nashua Gummed and Coated Paper Company, Nashua, N. H., and Pioneer Wrapper and Printing Company, 837 East 4th Place, Los Angeles. The last three mentioned respondents resigned their memberships in the trade association shortly prior to the service of the Commission's complaint on September 19, 1939.

Also named as respondent is Richard M. McClure, secretary-treasurer and manager of the National Converters Institute.

Commission findings are that the member respondents entered into agreements with each other to maintain uniform prices for the sale of their products, including the discounts to be allowed purchasers; exchanged through the medium of the trade association and of McClure, current price lists and confidential detailed information as to the conduct of their businesses.

The respondents are ordered to cease and desist from filing uniform prices and discounts at which their products are to be sold either directly or through the medium of the National Converters Institute and Richard M. McClure, or any other agency; exchanging through the medium of the Institute and its manager, or any other agency, price lists containing proposed or future prices and discounts of their products in order to establish net prices at which they will sell such products, or filing with the National Converters Institute and its manager, or any other agency, deviations in current price lists of their products in order to establish and maintain uniform net selling prices.

The respondents were also ordered to desist from agreeing among themselves that they will maintain proposed future prices and discounts published by them and filed with the Institute and Richard M. McClure, or any other agency, or collecting or disseminating information as to instances where respondent corporations have sold their products at prices and discounts other than those set forth in their respective price lists, in order to maintain the net prices and discounts which the respondent manufacturers agreed to maintain.

International Cellucotton Buys Patents

President Sensenbrenner of Kimberly-Clark Corp. Announces International Cellucotton Products Co. Has Purchased Patents and Equipment From Southern Kraft Corp. — Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., September 3, 1940—F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, Neenah, Wis., announced last week that the International Cellucotton Products Company has purchased patents, equipment and machinery for the manufacture of sanitary napkins from the Southern Kraft Corporation, Marinette, Wis.

One of the two converting machines used at the Marinette mill has already been shipped to Neenah, and the other will be moved there in the near future. Production will be taken over October 5.

Sale of the patent rights includes an exclusive fluffing process in making sanitary napkins. Southern Kraft's production of this item was a minor activity, since only 12 tons of paper were converted annually. Kimberly-Clark is the largest manufacturer in this field, its product, Kotex, and other items consuming 100 tons of paper daily.

Southern Kraft intends to replace the napkin machinery with additional equipment for its Veldown line of facial and toilet tissues. The machinery will arrive about October 15, and this department will undergo immediate expansion.

National Paper Can Co. Organized

The National Paper Can and Tube Company has been organized at Milwaukee, Wis., and will be in operation within a month in leased quarters at 728 E. Nash St. H. J. Berenson is president of the company, and John C. Mahoney will be plant superintendent. The concern has an authorized capital of 1,000 shares of preferred $10 par stock and 1,000 shares of no par common.

The company will start with 18 employees, and will manufacture paper cans and tubes for such items as spices.

Mr. Berenson started a paper can department for the Mueller and Son Company, Milwaukee, which was bought out some years ago by a St. Paul concern, which Berenson joined. He is returning to Milwaukee to take charge of operations of the new concern.

Output of Paper Mills Rising

Production in Wisconsin mills continues to swing upward, according to reports compiled for the month of July by the Wisconsin Industrial Commission. The number of wage earners in the mills increased from 22,900 in June, 1940 to 23,300 in July, a gain of 1.7 per cent. This mark is well above July of 1939, when the total was 21,000 workers, representing a gain of 10.5 per cent over a year ago.

Estimated weekly payrolls are $616,000 for July as against $612,000 for June, and $509,000 in July, 1939. The gain is .6 per cent over June, and 20.9 over a year ago. Wages per worker now average $26.48 per week for an average work week of 41.4 hours. The average hourly pay is 64 cents. The total payrolls were somewhat less than an average month because of vacations given employees in many mills ranging from three days to a week during the holiday shutdown July 4.

Most of the mills were shut down Saturday noon of last week until Tuesday of this week to give their employees a vacation over the Labor Day weekend. The Wisconsin River Pulp and Paper Company, Stevens Point, Wis., closed down on Friday so all workers had a 4-day recess.

Rainfall Aids Paper Mills

Railfall far beyond the usual summer average has given the mills in Wisconsin continuous water power and has obviated the use of steam power during summer drought spells, as has been customary in so many past seasons. Water levels are so high from recent heavy rains that sluice gates have been opened on the Fox and Wisconsin River dams to lower lake and reservoir levels and prevent flooding on riparian lands. Most of the reservoirs are at capacity.

Will of Frank Harwood Filed

The will of Frank J. Harwood, president of Appleton Woolen Mills, Appleton, Wis., who died August 19, has been filed in the probate court of Outagamie County. The value of the estate is not given, pending an appraisal.

The estate, including real estate, personal property, stocks and bonds, will be divided into 244½ equal shares, of which the widow receives 30 shares as well as the homestead and personal property. His two surviving daughters, Mrs. T. E. Orbison and Mrs. S. F. Shattuck, also receive thirty shares each, and Mr. Orbison receives ten shares. The grandchildren of the two families are each given seven shares. Employees of the firm and the number of shares received are: A. H. Wickesberg, 10; Allen H. Thuerer, 2; Lacey W. Horton, 2, and Isla R. Thompson, one half share. Other beneficiaries include: Ripon College, 25 shares; Northland College, 10; First Congregational Church, Appleton, 20; American Board of Foreign Missions, Boston, 10; home boards of Congregational churches, 10, and Lawrence College, Appleton, 5. A. H. Wickesberg was named executor of the estate.

Waste Dealers to Meet in Cleveland

According to a statement released from the executive offices of the National Association of Waste Material Dealers, Inc., that association will hold its fall convention in Cleveland, Ohio. The dates have not been definitely set but the convention will probably be held the latter part of October. It will be the first time that the association has held one of its conventions in Cleveland and indications are that the attendance will be unusually large.

Detailed information as to program and dates will be available shortly.

Midwest Expecting Stronger Paper Demand

Present Uncertainty In Paper Market In Chicago Territory Believed Waning With Stronger Consumer Demand Near—Uniform Sales Tax Regulation Proposed—Salesmen Play Golf—Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., September 3, 1940—A Chicago sales market, slightly uneasy because of an undertone of uncertainty, is waiting confidently for improvement in retail demand expected early this month. While prices have shown no major move downward it is reported that strong retail demand must come in the near future to bolster the general situation. While raw materials are scarce and production costs are high, the market is said to be finding nothing like sufficient demand to combine these factors toward markedly higher ground. General business uncertainty caused by the European situation, elections and other factors has not developed sufficiently as yet though retail sales here are showing a steady increase over 1939. Chicago and Illinois have received about $20,000,000 in government contracts so far this year but there has not been time for such business to be reflected in payrolls and specific purchasing power.

None of the markets were reported to have assumed "bellwether" proportions during the week, even the strong kraft market showing some let up in demand, according to reports. Sulphites were little or no changed while groundwoods and newsprints followed the general trend of "waiting until after Labor Day" for news. Books and covers did nothing of importance with demand reported to have tapered still further off during the week.

Propose Uniform Sales Tax Regulation

Paper mills and jobbers selling into States having sales taxes and for which they have hitherto been exempt because of the interstate commerce clause, will be interested to learn that the National Association of Tax Administrators, meeting in Chicago last week, recommended adoption of a uniform regulation on interstate commerce which may have a strong bearing on future sales tax procedure. The proposal follows:

Goods coming into the State: When tangible personal property is purchased for use or consumption and the seller is engaged in business in the State and delivery is made in the State such sale is subject to the sales tax. Such sale is taxable regardless of the fact that the purchaser's order may specify that the goods are to be manufactured or procured by the seller at a specified point outside this State and shipped directly to the purchaser from point of origin. It is immaterial that the contract of sale is closed by acceptance outside the state or that the contract is made before the property is brought into the State. Delivery in the proposed uniform regulation is held to have taken place when physical possession of the tangible personal property is actually transferred to the buyer within the State or when the tangible personal property is placed in the mails at a point outside this State directed to the buyer in the State or placed on board a carrier at a point outside the State (FOB or otherwise) and directed to the buyer in the State. Engaging in business in the State shall include maintaining directly, indirectly or through a subsidiary an office, distribution house, sales house, warehouse or other place of business or by having an agent, salesman or solicitor operating within the State under the authority of the seller or subsidiary irrespective of whether such place or agent is located in this State permanently or temporarily or whether or not seller or subsidiary is qualified to do business in this State. *When goods are shipped from the State* the tax does not apply provided the property is not returned to a point within the State. If this regulation is adopted by all States having sales taxes many paper firms will have to rearrange their sales procedure or meet the added cost.

Salesmen Honor Jim Coy

As was expected, the golf outing of the Salesmen's Association of the Paper Industry, midwest division, was a bit out of the ordinary. Held at the La Grange Country Club on August 23, the event—semi-final one of the current season—drew about sixty golfers who joined in with four members of the home club to make the event unique in many respects. The four are John T. Burrus, Albemarle Paper Manufacturing Company; F. X. Brucker, Hartford City Paper Company; James H. Coy, Flambeau Paper Company and Al Harmon, Pilcher Hamilton Company. In fact, one of the quartet, Jim Coy, was signaled out for special honors. The veteran and highly regarded member—long noted for his singing ability—was presented with a handsome director's baton and pitch pipe in recognition of his many years of work leading the songs at SAPI activities. The presentation made by Fred P. Whiteley, dean of paper mill salesmen, was likewise a genuine work of art.

Golf Prize Winners

From Pat Patterson, Flambeau Paper Company, chairman of the golf activities, comes the list of prize winners as follows: low gross, Gene Hamnes, Graham Paper Company (77); blind bogey, D. C. Frisbee, Midland Paper Company; low net (17 and under), P. Barkley, C. L. Barkley & Company; low net (18 and over), S. D. Dillon, Oxford Paper Company; second low net (18 and over), C. R. Mitchell, Graham Paper Company; third low net, Don Evans, W. C. Hamilton & Sons; low net, first nine, Bob Rousche, Mead Sales Company; low net, second nine, Phil A. Howard, American Paper Merchant; low putts, first nine, Henry Fulton, Blunden Lyon Company; low putts, second nine, Wood Jones, Messinger Paper Company; high gross foursome Paul Armstrong, John Schoemer, F. Swatekal of Parker, Thomas & Tucker Paper Company and R. C. Swan, Champion Paper & Fibre Company; low net foursome, W. B. Moore, Brown Company, I. McHenry, Mid States Gummed Paper Company, Hugh Brower, Wytek Sales Company and Gene Homnes, Graham Paper Company. Low putt foursome honors went to Henry Fulton, J. J. MacAllister, James White Paper Company; Charles Shepard, Bermingham & Prosser and Courtney H. Reeves, Allied Paper Mills.

Obituary

William H. Mason

[FROM OUR REGULAR CORRESPONDENT]

WAUSAU, Wis., September 3, 1940—William H. Mason, 63, vice-president of the Masonite Corporation with home offices in this city, and inventor of Masonite, died at Rochester, Minn., Saturday evening, August 25, following an operation. He was a resident of Laurel, Miss., where the company's mills are located.

Mr. Mason was born in Sommers County, West Virginia, February 19, 1877. He attended Washington and Lee University from 1894 to 1896 and Cornell University during 1897 and 1898. He aided in the construction of the Edison Portland Cement Company plant at Stewartsville, N. J., in 1899 and 1900 and served as general superintendent until 1914, when he became a general engineer with the Edison laboratories at East Orange, N. J., where he remained for two years. During 1916 and 1917 he was general superintendent of construction for the Merchants Shipbuilding Corporation at Bristol, Pa.

In 1920, Mr. Mason moved to Laurel, Miss., and started the business of obtaining naval stores (turpentine, pine oil and rosin) from sawn lumber. When the price dropped to about one-fifth what it had been, he looked around for other developments that might make a successful business. Having been a thorough student of wood, he set about to utilize the tremendous waste from sawmills, most of which was being burned. He thought it possible to soften wood by steam and then "explode" it by sudden release. Experiments which followed met with success and he turned to papermaking, but the resultant product was not of good quality so he abandoned it.

In seeking capital, Mr. Mason interested Ben Alexander of Wausau, Wis., now president of the Masonite Corporation, C. C. Yawkey, D. C. Everest, A. P. Woodson and others. They helped him form the Mason Syndicate for further development of the process. In the spring of 1925, Mr. Mason exploded about a carload of fiber at Laurel and brought it to Wausau for experiments in the manufacture of insulating board, and tests as to what paper mill machinery could be utilized. During experiments at the Marathon Paper Mills Company at Rothschild, an oversight in handling a steam press brought about the discovery of how a dense, hard, dry board could be produced from wood waste. The well-known Masonite Presdwood was the result. Further developments and the designing of proper machinery brought the product to a marketable basis, and the industry has been growing ever since.

In 1928 he was awarded the gold medal of the Technical Association of the Pulp and Paper Industry for his work. The following year he was granted the John Price Wetherell medal by Franklin Institute in recognition of his achievements. He also received the first $1,000 prize awarded by the National Lumber Manufacturers Association for improvements in the manufacture of lumber. Last fall he received the Pioneer Award of the National Association of Manufacturers for inventors who have opened up new industries. He was a member of TAPPI and the American Society of Mechanical Engineers.

Survivors are the widow and two daughters, Mrs. James Jefferson Mayfield of Tuscaloosa, Ala., and Miss Jean Alexander Mason of Laurel.

Funeral services were held at sundown Tuesday, August 27, at Laurel.

Stuart Moore

Stuart Moore of Dallas, Texas, one of the paper industry's best loved and most highly respected members, passed away suddenly at his home last month of a heart attack.

Mr. Moore, member of a pioneer Texas family and grandson of Hamilton Stuart, early Texas newspaperman, was vice-president of the Dixie Wax Paper Company of Dallas, Texas, and Memphis, Tenn., which position he had held since shortly after the company's organization eighteen years ago. He had the satisfaction of seeing the company grow from a very small concern to one of the largest and most efficient plants in the country. Mr. Moore was also one of the Governors of the American Waxed Paper Association. He was honored and esteemed both in the business world and in his private life, always giving liberally of his store of knowledge and experience, and quietly and unselfishly sharing his wealth with those less fortunate than he.

He is survived by his widow, Mary Austin Moore; one son, Stuart Moore, Jr.; one daughter, Nancy Moore; one brother, W. L. Moore, Sabinal, Uvalde County; and three sisters, Mrs. S. H. Huff, Luling, Mrs. W. W. Dunlap, Santa Rosa, and Miss Mary Moore, Austin.

Burial was at Luling, Texas, his boyhood home, and many were the relatives and friends gathered there to pay their last respects.

Frank J. Harwood

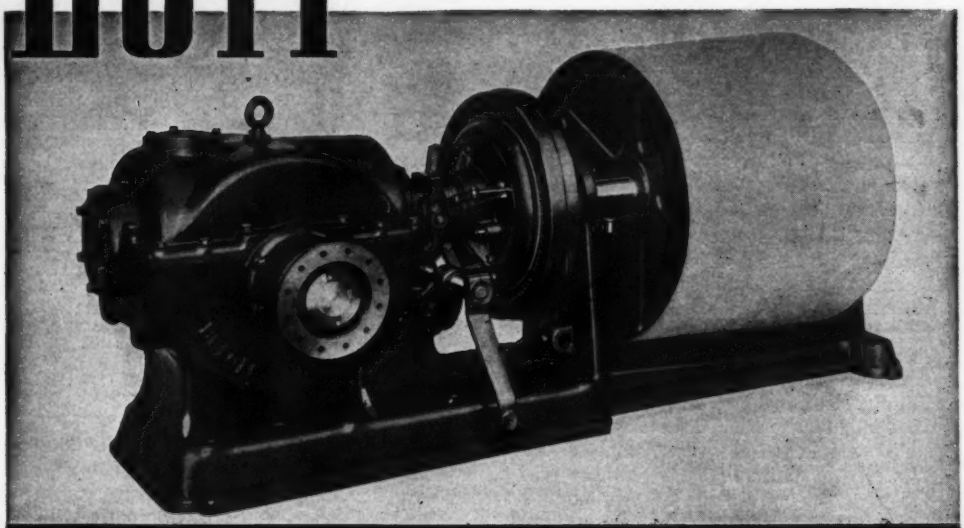
[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 26, 1940—Frank J. Harwood, 84, president of the Appleton Woolen Mills, died at 5:30 Monday afternoon, August 19, at St. Elizabeth hospital at Appleton, following an illness resulting from a fall April 27, when he broke his hip. He was the oldest industrialist in Appleton, and had been active in the management of the business until the accident occurred.

Mr. Harwood was born at Crown Point, N. Y., December 25, 1855. He moved to Ripon, Wis., in 1874 and came to Appleton two years later to become associated with Hutchinson and Company, manufacturers of woolens. The company was reorganized in 1881 and was incorporated as Appleton Woolen Mills. A. P. Harwood, his father, became the first president, and F. J. Harwood was the first general manager, holding that position for 59 years. The firm is one of the largest in the manufacture of paper mill felts.

All through his career, Mr. Harwood had been prominent in industrial, civic and church affairs. He was president of the Eagle Manufacturing Company, a director of the First National Bank of Appleton and of the Northern Paper Mills, Green Bay, Wis., and president of the Appleton Cemetery Association. He was a director and president of the Appleton Y. M. C. A. for forty years, and founded the Boys' Brigade, which flourished for many years. He was a member of the First Congregational Church for 63 years, and served as superintendent of its Sunday school for 40 consecutive years. In 1925 he was

BELOIT



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elected as moderator of the National Council of Congregational Churches. He also was a trustee of Ripon College, Ripon, Wis., and a charter member of the Appleton Rotary Club.

The survivors are his widow and two daughters, Mrs. S. F. Shattuck, Neenah, Wis., and Mrs. Thomas E. Orbison, Appleton; also seven grandchildren.

The First Congregational Church was filled nearly to capacity for the funeral services Thursday afternoon, August 22. They were conducted by the Rev. Dascomb Forbush, pastor, the Rev. John W. Wilson, retired superintendent of Wisconsin Congregational Churches, and Dr. Silas Evans, president of Ripon College. Private burial services were conducted at Riverside cemetery at Appleton.

Among the honorary pallbearers were F. J. Sensenbrenner, president of Kimberly-Clark Corporation, Neenah, Wis., E. J. Murray, president, and H. W. Tuttrup, treasurer, of the Northern Paper Mills, Green Bay, Wis., and A. F. Tuttle, president of the Tuttle Press Company, Appleton. The active bearers were Lacey Horton, of Appleton Woolen Mills; Ralph Wirth, manager of the Reedsburg, Wis. branch of Appleton Woolen Mills; A. C. Remley, of the Nekoosa-Edwards Paper Company, Port Edwards, Wis.; Foye Hutchinson of Evanston, Ill.; William T. Buchanan, president of Appleton Wire Works, and Dr. Thomas N. Barrows, president of Lawrence College and director of the Institute of Paper Chemistry, Appleton.

L. O. Koester, vice-president and general manager of the Orr Felt and Blanket Company, Piqua, Ohio, was present, representing the Wool Manufacturers Association.

Raymond S. Judd

Raymond Stanley Judd, age 50, sales executive for The Chatfield & Woods Company, Pittsburgh, Pa., died August 21, at Mercy Hospital, after a long illness.

Mr. Judd was highly regarded as one of the best informed paper men in the business, having had mill and many years merchant experience with The Chatfield & Woods Company. He had a host of friends among the printers and affiliated trades in Pittsburgh where he will be greatly missed.

A. O. Ryser Wins First Prize

The first prize-winner in the Cordova Idea File Contest for Chicago printers, as announced by Kenneth G. Sell, sales manager of the Detroit Sulphite Pulp and Paper Company, is Armin O. Ryser of the McGowan Printing Company, 1438 West Lake street, Chicago. Mr. Ryser received the cash award and the company with which he is associated has been given the order to print the copies of his design. These are to be distributed for insertion in the Cordova Idea Files being used by printers throughout the country.

The design submitted by Mr. Ryser is titled "Blackout!" and features "Steel Lined Hats in the Latest Fashions—Offering Extra Protection During Air Raids." A fictitious London firm name also appears. In one corner of the design is an airplane composed entirely of Tourist Gothic type characters. Printed in silver and red inks on a black Cordova Bristol, this unique and timely design is extremely effective.

Plan Interesting Safety Meeting

An unusually interesting program has been prepared for the annual meeting of the Paper and Pulp Section of the National Safety Council at the Stevens Hotel, Chicago, October 7 to 11 inclusive. Among the more outstanding features are the following:

Safe Handling of Materials such as Coal, Limestone, Clay, Saltcake, Sulphur, not including Pulpwood, by J. F. Robertson, personnel director, Crown Willamette Paper Company, Camas, Wash.

Safe Handling of Materials such as Rolls, Bales, Laps, Crates, Skids, Boxes, Barrels, Bags, by J. A. Long, superintendent, Bay West Paper Company, Green Bay, Wis.

Practical Uses of Accident Cost Data in the Safety Program from Viewpoint of the Senior Executive, by Earl E. Grant, president, The Crystal Tissue Company, Middletown, Ohio.

Practical Uses of Accident Cost Data in the Safety Program from Viewpoint of the Safety Directory, by Julius A. Draper, safety director, Consolidated Paper Corporation, Ltd.

D. S. Garber, safety director, Hummell & Downing Company, will present the committee's report on Paper Products Manufacturing.

E. D. Chapman, employment manager, R. R. Donnelley, & Sons Company, Chicago, will present the committee's report on Printing and Publishing.

There will be a panel discussion entitled, Safety from Woods to Mill, in which the following will participate:

J. E. Cantin, safety director, Quebec North Shore Paper Company, Baie Comeau, Quebec, Canada. Harris Flaherty, field officer, New Brunswick Accident Prevention Association, Dalhousie, N. B. W. D. Jenkins, safety director, British Columbia. Lumber and Shingle Manufacturers Association, Vancouver, B. C., Canada. F. H. Stafford, safety director, Chapman & Dewey Lumber Company, Marked Tree, Ark. G. R. Vaughan-Evans, employment supervisor, Anglo-Newfoundland Development Company, Ltd., Grand Falls, Newfoundland. C. E. Wilds, superintendent, wood operations, The Brown Paper Mill Company, Inc., Monroe, La.

There will be a Round Table Discussion on such subjects as: Safety Contest in the Plant; Maintaining Plant Tidiness and Good Order; Accident Causes; Home-Made Bulletin Board Material; Questions and Answers.

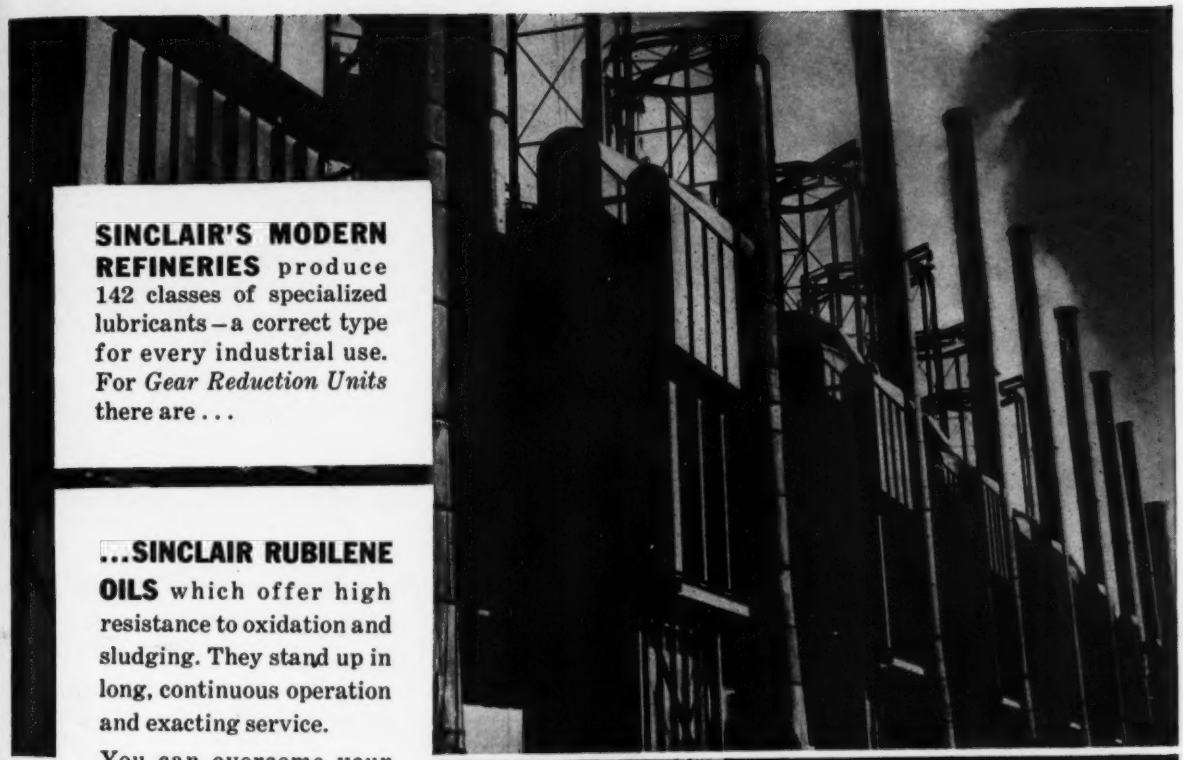
Rayonier Retains Pulp Prices

Rayonier Incorporated announced on August 30 that there will be no increase in dissolving the paper pulp prices for the fourth quarter of this year.

All mills are operating at full capacity to supply the increasing domestic demand for both types of pulps, as well as new markets in South America and Mexico.

While shipments to Europe are naturally restricted, Rayonier continues to supply considerable tonnage to both the European and Japanese markets.

Since paper pulps are an integral part of Rayonier's policy for a continuous domestic source of supply, intensive research is being directed to the development of new types, as well as the constant improvement of existing types.



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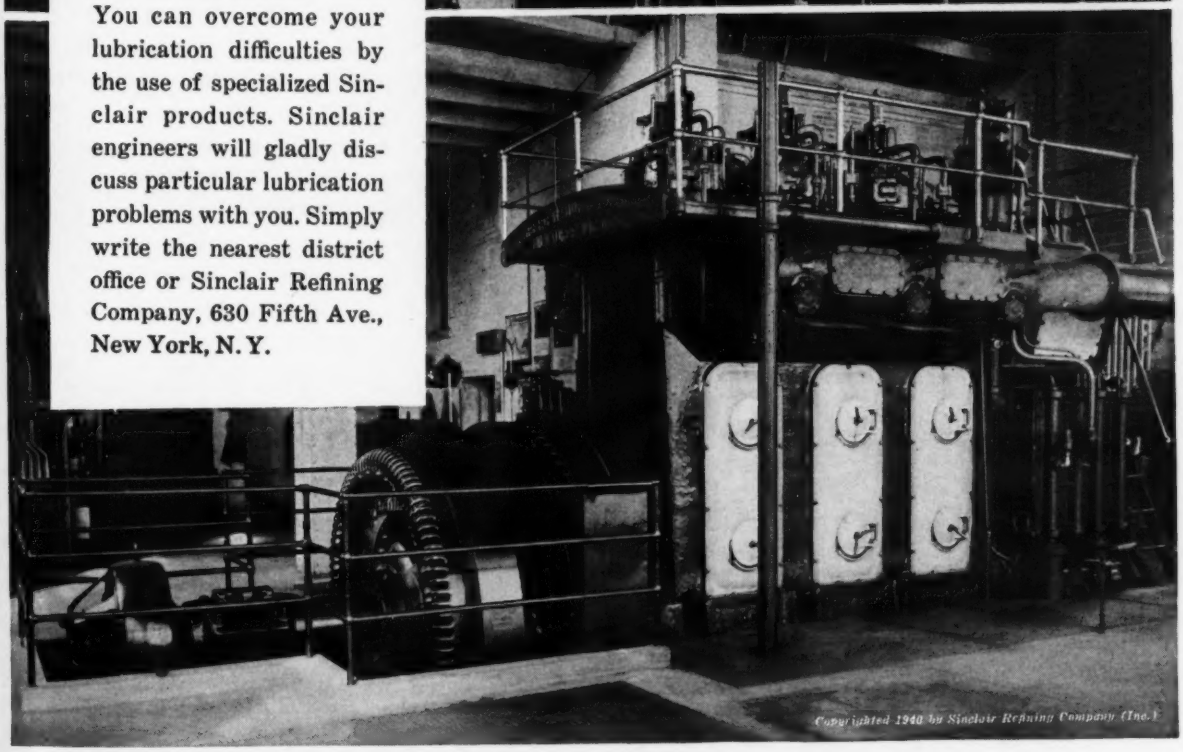
. . . SINCLAIR RUBILENE OILS which offer high resistance to oxidation and sludging. They stand up in long, continuous operation and exacting service.

You can overcome your lubrication difficulties by the use of specialized Sinclair products. Sinclair engineers will gladly discuss particular lubrication problems with you. Simply write the nearest district office or Sinclair Refining Company, 630 Fifth Ave., New York, N. Y.



SINCLAIR INDUSTRIAL OILS

SINCLAIR REFINING COMPANY (Inc.)

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FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending September 4, 1940

	High	Low	Last
A. P. W.	2½	2⅜	2½
Armstrong Cork Co.	34	30⅞	34
Celotex Corp.	6⅜	6⅛	6⅛
Celotex Corp., pf.	52½	52½	52½
Certain-Teed Products Corp.	4½	4¼	4⅜
Certain-Teed Products Corp., pf.	23¾	22⅜	23½
Champion Paper & Fibre Co.	....	....	....
Champion Paper & Fibre Co., pf.	103	102½	102½
Congoleum-Nairn Co.	17½	16	17½
Container Corp. of America	14⅜	14	14⅜
Continental-Diamond Fibre Co.	6¼	6¼	6¼
Crown-Zellerbach Co.	16	14⅝	16
Crown-Zellerbach Co., pf.	89	85¾	88¾
Flintkote Co.	15½	14⅞	15½
Robert Gair	2¾	2¾	2¾
Robert Gair, pf.	12¾	12¾	12¾
International Paper & Power	15⅞	14½	15¾
International Paper & Power, pf.	64	58⅜	63¾
Johns-Manville Corp.	68	61	68
Johns-Manville Corp., pf.	125	125	125
Kimberly Clark Corp.	36	34¼	36
MacAndrews & Forbes	....	....	....
MacAndrews & Forbes, pf.	128	128	128
Masonite Corp.	28½	26	28½
Mead Corp.	9¼	8⅞	9¼
Mead Corp., pf.	80	80	80
Paraffine Companies, Inc.	35	35	35
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	17⅞	16¼	17¼
Rayonier, Inc., pf.	30	29½	30
Ruberoid Co.	15½	14	15½
Scott Paper Co.	39	37⅝	39
Scott Paper Co., pf.	108	108	108
Sutherland Paper Co.	....	....	....
Union Bag & Paper Corp.	12¾	11⅞	12¾
United Paperboard Co.	4	3⅞	4
U. S. Gypsum Co.	75½	71½	75½
U. S. Gypsum Co., pf.	182	181	181

New York Curb Exchange

High, Low and Last for Week Ending September 4, 1940

	High	Low	Last
American Box Board Co.	4¾	4¾	4¾
Brown Co., pf.	20	19	20
Great Northern Paper	40½	40½	40½
National Container Corp.	11	10½	11
St. Regis Paper Co.	3	2¾	3
St. Regis Paper Co., pf.	63½	63½	63½
Taggart Corp.	3½	3	3⅛

Sutherland Paper Sells Privately

The Sutherland Paper Company has made a private sale of $1,000,000 of its debentures through Hall & Co. of Chicago instead of offering common shares as had been contemplated, according to a letter to stockholders made public at the Stock Exchange today. The letter stated that the price of company's stock declined after the original proposal to a point where it seemed inadvisable to follow the plan of offering the new stock to present stockholders.

The debentures sold will bear interest at the rate of 2.77 per cent and will mature in ten years at the rate of $100,000 a year. The proceeds are being used to retire all bank loans and for new working capital. The company withdrew its application to the Securities and Exchange Commission for registration of the common stock it had intended to issue. The company reported a net income of $50,066 for the first seven months of 1940 compared with $303,660 in the same period of 1939.

Union Bag Increases Dividend

Directors of the Union Bag and Paper Corporation have declared a dividend of 25 cents a share on the capital stock, payable September 16 to stockholders of record September 9. Dividends of 15 cents a share on the capital stock were paid on July 12 and April 5 of this year.

Crown Zellerbach Earnings Up

The Crown Zellerbach Corporation and subsidiaries in a report for the three months ended on July 31, show the second largest quarterly earnings in the history of the company. The consolidated net profit for the period, comprising the first quarter of its current fiscal year, was $2,501,522 after depreciation, depletion, interest, taxes and minority interests.

After allowing for preferred dividends, the profit is equal to 81 cents each on 2,261,199 shares of common stock outstanding. It represents an increase of 44 per cent over the $1,729,874 earned in the three months ended on July 31, 1939, equal to 47 cents a common share.

United States and Canadian income taxes and Canadian excess profits taxes increased $1,336,865 from $404,348. Taxes for the 1940 period were computed on the basis of existing tax laws. Legislation with regard to United States excess profits taxes was still pending at the close of the period and no provision therefor was made.

The company also announced that sales for the three months established a new high quarterly record at $16,717,760 and were 30 per cent above the $12,778,623 volume reported for the quarter ended on July 31, 1939.

West Virginia Nets $1,875,798

The West Virginia Pulp and Paper Company reported for nine months ended July 31, 1940 a net profit of $1,875,798 after federal income taxes and $621,665 premium and expense of bonds retired, equal, after dividend requirements on preferred, to $1.30 a share on common. This compares with $400,289, or $2.59 a share on preferred for the nine months ended July 31, 1939.

Hummel-Ross Profits Up

The Hummel-Ross Fibre Corporation for the six months to June 30, reports a net profit of $365,758, equal after deducting $20,460 dividend requirements on 6 per cent preferred stock to 88 cents a share on 391,706 common shares. Net profit last year was $37,806 or 4 cents a common share. Net sales were $1,829,190 and $1,145,706, respectively.

Consolidated Issues Shares

The Consolidated Paper Corporation, Ltd., has advised Montreal Curb Market that as of July 31st, 158,076 shares of the company's capital stock had been issued in payment of interest on the first mortgage bonds which was due July 2, 1940. As of the end of July, outstanding capital stock totaled 2,466,865 shares.

Celotex Earns $422,855

The Celotex Corporation and wholly owned subsidiaries for the quarter ended July 31, reports a net income of $422,855 after charges, equal after pre-

SMITH ALLOY-LINED PRESSURE VESSELS

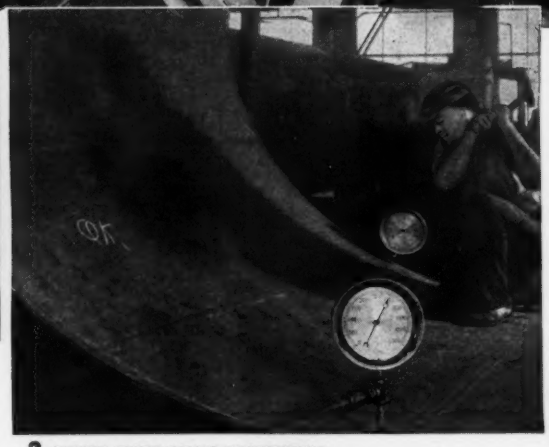
Are Available for the Paper Industry

EXPERIENCE LOOKS BEFORE IT LEAPS . . .

perience gained in fabricating most of the h-pressure vessels with corrosion-resist- linings now in service in a wide variety industries proves to A. O. Smith that no e of thumb can safely be followed in ir construction. Smith approaches each of Smithlining with the caution that is ays the hallmark of experience.

NEW PROBLEMS . . . NEW ANSWERS . . .

w processes and demands for greater nomy often create new corrosion prob- s. Different fabricating methods also affect corrosion-resisting properties of many oys. When no precedent exists, the safe proach is to duplicate the after-fabrica- n condition of the alloy—and *then* test it.



3. TESTS THAT MEAN SOMETHING . . .

Linings under high temperature or severe corrosive service must be tested to assure good bond and free-dom from porosity.

4. THE SMITH PLAN OF OPERATION . . .

When you bring your lined pressure vessel problem to Smith, you project it against the world's broadest background of metallurgical experience in the construction of such vessels. The right answer is not impossible to find—but no rule of thumb will ever find it. Make no mistake about that! A. O. Smith Corporation, Milwaukee, Wisconsin. Offices at: New York, Pittsburgh, Chicago, Tulsa, Dallas, Shreveport, Houston, Corpus Christi, Los Angeles.

SMITH PRESSURE VESSELS

A. O. SMITH CORPORATION

Milwaukee, Wisconsin

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Pressure Vessels

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ferred dividends to 61 cents a share on 627,676 common shares, excluding 10,734 shares in treasury, compared with $436,774, equal to 63 cents a share on 638,410 common shares in the July quarter of 1939, and $77,469, equal to 6 cents a share on 635,592 shares in the quarter ended April 30.

Wall Paper Business Improves

The United Wall Paper Factories, Inc., Chicago, world's largest manufacturer of wallpapers with two of its largest factories here and in Joliet, Ill., reported this week that its earnings in the fiscal year ended June 30 were the best for any year since 1930. Net income, according to Albert J. Browning, president, amounted to $320,265, equal to 23 cents a share on the common stock compared with a net loss of $216,198 in the preceding year. Sales increased 20 per cent over the preceding year, aggregating $6,329,223 against $5,297,132 in the 1939 period. Mr. Browning pointed out that improvement in plant and production equipment last year resulted in more economical operations and he attributed the large increase in sales to an intensive national advertising program undertaken about a year ago.

Dixie-Vortex to Expand

The Dixie-Vortex Company has placed building contracts for two plant additions to provide for current expansion in manufacturing activities and for increased volume of sales. About $200,000 will be spent for the projects. An addition of six stories and basement to cost upward of $100,000 will be built at the company's plant here for use principally for storage of finished goods.

Dixie-Vortex sales continue to run ahead of last year. The company is understood to be interested in manufacture of containers for frozen foods and may expand its activities in this field because of the increasing demand for frosted food products.

Central Paper Earns $2.88

The Central Paper Company, Inc. for the year to June 30 reports a net income of $442,637, equal to $2.88 each on 145,578 shares of common stock, compared with $121,328, or 54 cents a share, in year to June 30, 1939.

Imperial Paper Nets $737,409

The Imperial Paper and Color Corporation reports a net profit for the year of $737,409.85 and declared a semi-annual dividend of 75 cents a share to stockholders of record Sept. 20, payable October 1.

Central Paper Earnings Rise

The Central Paper Company reports for the year ended June 30, a net income of $442,637, equal to $2.88 a share on the common, compared with $121,328 or 54 cents a share in the preceding year.

S. D. Warren Votes Dividend

BOSTON, Mass., September 3, 1940—The S. D. Warren Company has declared a dividend of 75 cents, payable September 23 to stockholders of record September 18.

No Difficulty in Visiting Canada

R. S. Kellogg, secretary of the Newsprint Service Bureau, who, with Mrs. Kellogg, has just returned to New York from a long trip including a considerable stretch of Canadian territory, writes as follows:

"Since so much misinformation has for several months been circulated in the United States, either intentionally or mistakenly, in regard to hypothetical difficulties to be encountered by United States citizens in visiting Canada and returning to this country, I wish to relate a little personal experience.

"Mrs. Kellogg and I have just returned from a 3,300-mile automobile trip during which we entered Canada via Niagara Falls and came out at Calais, Me., with stops at all large cities and numerous small, out-of-the-way places. We were warmly welcomed everywhere, and the only regret expressed anywhere was that fewer Americans than usual are in Canada this summer. With the possible exception of the hotels in Ottawa and Quebec, rates are the same as they have always been, and in the smaller communities—particularly in the Gaspe-New Brunswick country—they are very moderate. Uncle Sam's dollars are received for $1.10 everywhere, and that too is no little item on an extended trip.

"I have traveled in Canada for thirty-five years and never had less bother with customs and immigration authorities, either going or coming, than this time. In fact, the only question asked was as to birthplace and no substantiating documents were required in connection therewith."

Sorg Paper Co. Sells Its Bag Division

MIDDLETOWN, Ohio, August 27, 1940—It was announced today by D. G. Driscoll, executive vice-president of the Sorg Paper Company and E. E. Brown, vice-president and general manager of the Superior-Lawrence Bag Company, a newly-formed corporation, that the Sorg Paper Company had sold to Superior-Lawrence Bag Company, the machinery, equipment, good will and business of the Bag Division of the Sorg Paper Company.

The new company will continue the manufacture and sale of the usual line of bags heretofore manufactured by the Bag Division of the Sorg Paper Company and other lines of bags to be announced later.

It is contemplated that for the time being the new company will operate its sales from the building previously occupied by the Bag Division of the Sorg Paper Company, at Middletown, Ohio, but the bags will be manufactured at and shipped from factories at Savannah, Ga., Hudson Falls, N. Y., and Chicago, Ill.

R. B. Whittemore Resigns

YORK, Pa., August 28, 1940—R. B. Whittemore, manager of the plant of the Certain-teed Products Corporation at this place resigned his position effective August 31. After spending a short vacation in St. Louis, Mo., Whittemore will return to York and from then on his plans are rather indefinite as he has not yet made any arrangements for the future.

James Richard Carter, III

Of the original James Richard Carter was said, "His genial smile and happy ways always impress on me that he is a gentleman of fine character and one we are always glad to meet." To this heritage, and into a dynasty of four generations in the paper business was born, on August 15, 1940, James Richard Carter, III.

The inception of a Carter into the paper business goes back into the dark ages of that industry; back to mills that measured their output in boastful pounds rather than the accepted tons of today; back to Richard Bridge Carter, father of James Richard Carter, who, in 1837, with John H. Wilkins, formed the partnership of Wilkins and Carter. Upon the death of Richard Bridge Carter in 1852 the firm name was changed to Rice, Kendall & Company and, for many years, enjoyed a prosperous career.

With a knowledge of paper already well founded, James Richard Carter, age 21, and Fredrick W. Rice, age 20, purchased, in 1871, the stock and good will of the small paper business owned by William McAdams and located at 13 Spring Lane, Boston. This business, founded primarily on courage and youthful enthusiasm, prospered and grew. Today, the firm of Carter, Rice & Co. Corporation is numbered among the nation's largest and most influential paper merchants.

The eldest son of James Richard Carter, Hubert L., followed in his family's footsteps and, after his graduation from Harvard, Class of '98, entered the family business with which he has been associated for more than forty years. He is vice-president of Carter, Rice & Co., Corporation and vice-president of Carter, Rice & Carpenter Company, Denver. He has served in several other executive positions.

On July 14, 1907, James Richard Carter, II, was born to Hubert L. and Edith Carter. This lad, too, was destined to follow the romance of paper. He gained his early experience as a merchant salesman during summer vacations from Harvard, where he was a member of the Class of 1929. Upon completion of his courses at that institution, James Richard II, served for a brief period as an investment broker —an experience that made him realize that he preferred to sell real merchandise rather than securities.

In 1932 he returned to Harvard for further training in the Business School and, in 1933, he served as assistant to the secretary of the American Paper and Pulp Association in New York. His work there gave him a wide acquaintanceship among the paper manufacturers. During the early days of NRA and business codes the Nashua Gummed and Coated Paper Company needed a man of his experience and James Richard Carter II joined that organization in September, 1934. He now serves as sales manager of the Coating and Gumming Division.

The new James Richard III has not expressed himself as to his future business career and only time will tell if this youngster will carry the name of Carter on into the business that is his birthright.

Hauptli-Worthing Engagement

Announcement is made of the engagement of Robert W. Hauptli of Dubuque, Iowa, and Miss Janet Worthing of Fond du Lac, Wis. Both attended Lawrence College at Appleton, Wis. Mr. Hauptli is associated with the Maizewood Insulation Co.

HERE'S A CURE FOR BELT KILLING DRIVES

Paper mills everywhere have found that Cincinnati Transmission Belts are the cure for belt-wearing, killing drives.

Many mills that started with one Cincinnati Transmission Belt are now 100% equipped . . . because actual service brought out important facts regarding stamina on punishing drives and money saving due to longer service.

Cincinnati Transmission Belts are the modern, efficient belts for paper mill service today. Get all the facts before you buy another transmission belt.

THE CINCINNATI RUBBER MFG. CO.
Cincinnati, Ohio

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CONSTRUCTION NEWS

Bellingham, Wash.—The Puget Sound Pulp and Timber Company has plans under way for new addition to unbleached sulphite pulp mill, consisting of several one and multi-story units, to be equipped for a capacity of about 50,000 tons per year, estimated to cost close to $1,500,000, with equipment. Expansion will develop a total mill capacity of approximately 150,000 tons per annum, and is estimated to cost about $1,500,000, with equipment. It is proposed to begin construction early in fall and have new units ready for service in March 1941.

Chicago, Ill.—The Traver Corporation, 358 West Ontario street, manufacturer of paper products, paper boxes and containers, has plans under way for new addition to plant, to be two-story, 100 x 136 feet, reported to cost close to $80,000, including equipment. Considerable increase in present capacity will be carried out. Bids are scheduled to be asked soon on general erection contract. William J. Ryan, 43 East Ohio street, is architect.

Los Angeles, Cal.—The United States Hardware and Paper Company, 3001 East Pico street, manufacturer of building papers and other paper products, has awarded general contract to Hyman Gorelnik, 117 South Poinsettia place, for proposed new paper processing plant at Soto and East Twenty-sixth streets, Vernon, recently referred to in these columns, and work will be placed under way at early date. It will be one-story, 300 x 400 feet. A portion of structure will be used for storage and distribution, and remainder used for paper production division. Cost estimated over $100,000, including equipment. Marcus P. Miller, Board of Trade Building, Los Angeles, is architect.

Lancaster, Pa.—The Armstrong Cork Company, manufacturer of insulation board products, etc., has completed plans for one-story addition, to be used for storage and distribution. Cost reported over $40,000, with equipment; bids are being asked on general erection contract and work will be placed under way soon.

Somerville, Mass.—Fire recently damaged a portion of local mill of Statler Tissue Company, 32 McGrath highway, with nominal loss placed at close to $5,000. Company is planning early rebuilding.

Cleveland, Ohio—Bids are being asked by the Cleveland Railway Company, Midland Building, for remodeling and improving its one-story building at 10200 Miles avenue, S. E., formerly used as a car barn, to be occupied under lease by the River Raisin Paper Company, 2525 East 93rd street, Cleveland, as recently noted in these columns. It will be used for new branch plant for the manufacture of paper boxes and containers. Award for modernization is scheduled to be made soon, with cost reported close to $50,000. Main offices of company are at Monroe, Mich.; James M. Hamilton is manager for company at Cleveland.

Chicago, Ill.—The Globe Paper Box Company, Inc., 223 West Huron street, has been chartered with capital of $200,000, to manufacture paper boxes and containers, and will take over and succeed to the company of same name, with plant at location noted. Expansion in operations is planned. Incorporators of new company include A. I., M., and L. W. Gidwitz.

Dallas, Tex.—Fleming & Sons Paper Mills, 1116 East 12th street, manufacturers of paper products, has work under way on new one-story and basement addition, recently referred to in these columns, and structure is scheduled to be ready for occupancy in fall. It will be used for increased production and is estimated to cost over $35,000, with equipment. James P. Baugh, 2908 North Fitzhugh street, Dallas, is architect.

New York, N. Y.—The Ajax Manufacturing Corporation, 119 North Fourth street, Philadelphia, Pa., manufacturer of cardboard products, has arranged for lease of space in building at 54 Bleecker street, New York, and will occupy for new factory branch, with storage and distribution facilities.

Chicago, Ill.—The Dixie-Vortex Company, 421 North Western avenue, manufacturer of paper cups and other paper containers, has approved plans for two new additions to local plant for large increase in present capacity. New units will be one and multi-story type and are estimated to cost close to $200,000 including equipment. Work is scheduled to be placed under way at early date.

Wisconsin Rapids, Wis.—The Consolidated Water Power and Paper Company, manufacturer of book and kindred paper stocks, has foundations in progress for new steam power house at local mill, and will proceed with superstructure at early date. Station will be 40 x 40 feet, equivalent to four stories in height, and is reported to cost in excess of $70,000, with boiler units and other equipment. Erection is being carried out by day labor. Thomas Utegaard is company engineer in charge.

Chicago, Ill.—Paper Industries, Inc., 444 West Grand avenue, recently organized with capital of 100 shares of stock, no par value, will operate a local plant for the manufacture of a line of paper specialties, including packaging materials. G. A. and J. R. Bent are incorporators.

New York, N. Y.—The Globe Cardboard Novelty Company, Philadelphia, Pa., has leased space in building at 515 Greenwich street, and will occupy for plant for the production of cardboard and other paper specialties, including storage and distribution.

Three Rivers, Que.—The Canadian International Paper Company, Sun Life Building, Montreal, Que., manufacturer of newsprint, etc., plans expansion and improvements in mill at Three Rivers, including new addition and installation of equipment for increased capacity. Cost estimated close to $300,000, including machinery. Work is scheduled to begin at early date.

Los Angeles, Calif.—The Boston Envelope Company, Inc., Los Angeles, has taken out a charter under state laws, with capital of $200,000 and 7000 shares of stock, no par value, to manufacture and deal in commercial envelopes and other paper goods. New company is affiliated with the Boston Envelope

Company, 279 High street, Dedham, Mass., as its Pacific Coast interest. Harry O. Bishop, 1717 Industrial street, Los Angeles, is representative.

Toronto, Ont.—E. S. & A. Robinson (Canada), Ltd., 888 Dupont street, manufacturer of waxed and other processed paper stocks, has completed plans for new one-story mill in Leaside district, reported to cost over $85,000, including equipment. Bids have been asked on general contract and erection will be placed under way soon. Margison & Babcock, 210 Dundas street West, Toronto, are consulting engineers.

Cornwall, Ont.—The Howard Smith Paper Mills, Ltd., 407 McGill street, Montreal, Que., manufacturer of writing and other paper stocks, box board, etc., has awarded general contract to A. F. Byers & Company, Ltd., 1226 University street, Montreal, for one-story addition to mill at Cornwall, reported to cost over $50,000. Work will proceed at once. J. C. Day, 630 Dorchester street West, Montreal, is architect.

E. L. Luaces to Practice Patent Law

E. L. Luaces has established an office at 1107 Broadway, New York (CHelsea 3-3600), where he will engage in patent practice in the fields of chemistry, metallurgy and engineering, in which he has had experience during the past 16 years. He was for a number of years with the West Virginia Pulp and Paper Company, and more recently spent five years in charge of engineering and patents with Acticarbone Corporation, of New York, Paris and London.

South Conserves Timber Supply

SHREVEPORT, La., August 28, 1940—The South has the fastest reproducing timber lands in the world and has increased its capacity to produce paper from that timber from 274 tons daily in 1920 to 8,587 tons in 1939, Ray L. Junod, vice-president and director of sales of the Brown Paper Mill Company, Monroe, told members of the Shreveport Lions club last week in the Washington-Youree hotel. Pulpwood may be cut from these lands every 10 to 12 years, Mr. Junod said.

Usually it is thought, he continued, that industries based on natural resources are destructive. "But no such view can be taken of the Southern paper industry. On the contrary, it has assisted in the reforestation of denuded lands, given new life to areas which had slumped with the decline of the lumber industry and put tangible values into worthless cut-over lands."

The paper industry has practiced the latest methods of improving timber stands, Mr. Junod said, in spite of the opposition of many small landowners. He commended the work of the federal government in the reforestation of lands and the educational efforts of schools in conservation work.

In 1920, he said, the South had 43 per cent of the Kraft pulp producing capacity of the United States. This capacity increased to 82 per cent in 1929.

For each ton of pulp capacity, $30,000 must be invested because the paper industry is a heavy capital goods industry. During the period of the industry's remarkable growth from 1930 to 1940, it was not easy to find the necessary capital for this expansion, Mr. Junod said.

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WIRES
are Good wires
Appleton Wire Works, Inc. Appleton, Wis.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 111 September 5, 1940 No. 10

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

National Safety Council, Paper and Pulp Section, Annual Meeting, Stevens Hotel, Chicago, Ill. October 7-11.

National Paper Trade Association, annual Fall Meeting, Stevens Hotel, Chicago, Ill. September 23-25.

BUSINESS TREND UPWARD

Continuation of the rising activity in the paper and pulp industry is freely predicted within and outside the industry. It is based upon the solid foundation of high and expanding general business activity. In commenting on the state of business *The Guaranty Survey*, published on August 26 by the Guaranty Trust Company of New York comments on the broader aspects of business in part as follows: "At the close of its first year, the conflict in Europe, which started at the beginning of September, 1939, appears to have had fewer adverse effects on current business conditions in this country than might have been expected. Its consequences have been highly irregular and, in some directions, distinctly unfavorable. On the whole, however, its influence has probably been stimulating rather than otherwise."

"Unfortunately, these partly favorable effects are of minor significance in comparison with the sweeping and permanent readjustments that the conflict is likely to entail. Both the nature and the extent of these prospective changes will depend largely on the duration and outcome of the conflict. It seems inevitable, however, that the conflict must eventually bring American business face to face with some of the most difficult problems with which it has ever had to deal."

In commenting on various phases of the influences of the conflict, the same source says in part: "A possible repetition of the great inflation of prices that accompanied the last world conflict has been feared in some quarters, and visions of some such developments were indicated by the sudden wave of speculative buying in the first weeks of the current conflict. While there is no complete assurance that inflationary influences in American commodity markets will remain well restrained for the duration of hostilities, perhaps more concern is now felt regarding potentialities in the opposite direction; the further curtailment of effective demand for American merchandise in many foreign markets and consequent depression of prices."

In pointing out that it is not yet apparent how boardly our trade will be affected by the recently announced restrictions on exports as a defense measure, *The Survey* states in part: "However desirable such self-sufficiency planning here may appear in contemplation of possible emergencies, curtailment of purchases of foreign production necessarily tends to restrict the potentialities of markets abroad as outlets for American products. Immediate attention is being directed to problems of Western Hemisphere defense and economic cooperation. The plan for a huge international cartel to deal in the surplus products of the Americas has apparently given way to a more modest program for financing Latin-American trade and industrial development. Agreements reached in the recent inter-American conference at Havana are generally gratifying, although they provide no definite indication of the steps to be taken in meeting post-war trade problems. These preliminary attempts are significant chiefly as indicating a general recognition of the drastic readjustments that are expected to become necessary as a result of the conflict."

Business levels are well maintained, *The Survey* states and "For the most part, the principal indicators of general business activity have continued to point to well sustained levels of output and distribution, although some irregularity has been apparent and the influence of seasonal factors has been noticeable in certain directions. . . . The bill to expand the lending authority of the Export-Import Bank by $500,000,000 to permit loans to Western Hemisphere nations for industrial and trade purposes has been passed by the House of Representatives and approved by the Senate committee. Such loans could be made regardless of existing restrictions or prohibitions, a provision that is interpreted as permitting credit extensions to Canada. The purpose of the loans, according to the bill, would be 'to assist in the development of the resources, the stabilization of the economies, and the orderly marketing of products of the countries of the Western Hemisphere'. In recommending the legislation to Congress last month, the President indicated that there was no intention to prevent the normal exchange of commodities between other continents and America but that 'what can and should be done is to prevent excessive fluctuations caused by distressed selling resulting from temporary interruption in the flow of trade or the

fact that there has not yet been reestablished a system of free exchange.' "

From a brief examination of the conflict in 1914 and the current conflict on prices and exports, it will be noted that instead of the export decline experienced in 1914, there has been a remarkable increase in exports, although recently some indications of a decline have been reported. In 1914, exports declined for several months and then increased in 1918 to almost double the exports of 1914. In noting the movements of prices, comment has been made that after the price rise of last year all upward movements were checked. The most speculative commodities leveled off after reaching a peak last September and until recently were downward and reached a low level almost 5 per cent above the levels at the outbreak of the European conflict last September. The index of the Labor Bureau is approximately 5 per cent higher than one year ago.

This state of business corresponds more or less closely with price movements in the last conflict, when the great advance in prices began a year after the conflict opened. The various controlling measures applied to check an undue price rise last year, appear adequate to control inflation now and in the future and it is doubtful if history will again repeat itself in this form of inflation, despite the buoyancy of prices at the present time. The outlook for both industry and trade is very favorable, with general industrial production up approximately 13 per cent during the current year and with general trade activity close to 8 per cent above that of a year ago.

Work of the Import Committee

The manner in which the work of the Import Committee covers the entire field of foreign competition with American papers is shown by a summary of the 11,000 cases before the committee in the past fifteen years. In the number of cases handled by the Import Committee, fine and writing papers lead the list. It is impossible to compute the direct value to the industry of many individual cases, for sometimes a single case has established a precedent which affected the entire field of foreign competition. Thus, one case resulted in the stoppage of all imports of rotogravure paper, a dutiable paper which had been coming in duty free, misclassified as standard newsprint. This single case entirely stopped imports from Germany of dutiable printing paper to a value of $1,000,000 a year.

The following tabulation shows the manner in which the Import Committee has carried on its work in the various divisions of the industry:

Grade	No. Cases Won or Successfully Closed	Number Cases Lost	No. Cases Tried Not Yet Decided	No. Cases Pending	Total
Fine	2,085	316	3	194	2,598
Specialties	1,458	267	3	290	2,018
Tissue	1,260	490	6	188	1,944
Wrapping	644	538	9	310	1,501
Boards	729	119	25	76	949
Printing	748	136	..	31	915
Miscellaneous	492	46	1	63	602
Newsprint	398	72	..	42	512
Totals	7,814	1,984	47	1,194	11,039

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.2%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	86.2%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	83.9%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	86.3%	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	91.7%	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	94.2%	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	87.2%	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	.....	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	.....	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 34 weeks	88.6%	80.6%	69.2%	88.2%	79.1%	69.1%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
July 20	93.1%	July 22	81.1%
July 27	89.8%	July 29	81.7%
August 3	89.5%	August 5	80.5%
August 10	90.2%	August 12	82.9%
August 17	85.9%	August 19	82.9%
*August 24	89.2%	August 26	83.3%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting—Current Weeks: July 20, 1940	July 27, 1940	Aug. 3, 1940	Aug. 10, 1940	Aug. 17, 1940	Aug. 24, 1940
0% to 50%	39	47	46	45	50	46
51% to 100%	256	247	249	243	225	205
Total Mills Reporting	295	294	295	288	275	251

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	70%	76%	79%	72%

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	....	....	....	....	....	....

Week end. July 20, 1940—77%
Week end. July 27, 1940—74%
Week end. Aug. 3, 1940—74%
Week end. Aug. 10, 1940—74%
Week end. Aug. 17, 1940—73%
Week end. Aug. 24, 1940—74%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

* Preliminary figure.

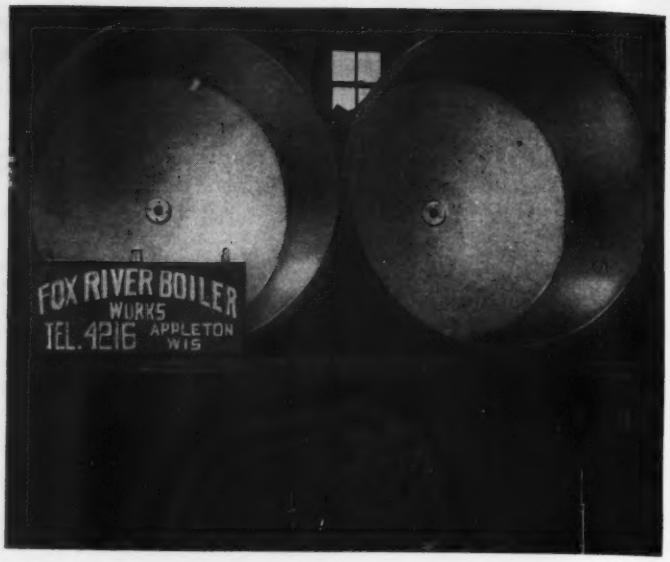
A. R. Schorer on Watervliet Board

KALAMAZOO, Mich., August 28, 1940—Arno R. Schorer, Kalamazoo insurance man, has been elected to the board of directors of the Watervliet Paper Company, replacing the late August B. Scheid. At the same meeting, directors of the company approved installation of a new water wheel and generator in the mill at a cost of $60,000.

Mr. Schorer is a former resident of Watervliet and several years ago served as manager of the mill. He is president and treasurer of the A. R. Schorer Company of Kalamazoo, insurance agency.

Approval of the water wheel replacement climaxes a survey to that end that has been conducted at the mill for some time by the Fargoe Engineering Company, with H. S. Hunt in charge. Directors left it to the discretion of the mill's consulting engineers to replace the old wheel, installed in 1893 when the plant was built, with a large wheel or two smaller wheels.

LET THIS "SHAVING" Show you a *Big Saving!*



Above are shown two of the clay emulsion mixing tanks fabricated of Type 304 IngAclad Stainless-Clad Steel for Fox River Paper Company, Appleton, Wisconsin, by Fox River Boiler Works of that city. These tanks are 6 ft. in diameter, 5 ft. high, with straight shell and flanged and dished bottoms. 10-gauge IngAclad used for shell, and 3/16" IngAclad Plate for the bottoms.

Use the Steel that is Stainless on the side that is used!

The Paper Field is finding in IngAclad Stainless-Clad Steel the solution to many problems of plant and product improvement. In some cases, old vats and tanks are being relined right on the job without serious work interruption. Others are using IngAclad Plates or Sheets in the fabrication of new stainless equipment at much lower material cost.

The large metal shaving at left shows how by Ingersoll Patented Process, it is now possible to inseparably bond finest quality stainless to lower cost mild steel and give you the stainless service you require.

IngAclad makes your stainless money go much farther, yet gives you full stainless protection on the contact side.

Your product is improved. You modernize your plant at lower cost. You are able to use stainless where the price of the solid metal has heretofore been prohibitive. You salvage and rehabilitate much old equipment, and have the work done quickly without shutting down your plant. Remember, IngAclad now has a record of *nearly 10 years of service*, including practically every field of processing and manufacturing, where corrosion is a problem.

Ingersoll offers the broadest service in the non-corrosive field. We supply, in addition to IngAclad Sheets and Plates, Solid Stainless Sheets and Plates, Nickel-Clad Sheets and Heat-Resisting Alloy Sheets and Plates. Let us estimate on your requirements.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Pulping of Douglas Fir with Nitric Acid*

By H. K. Benson[1] and A. T. Walton[2]

Abstract

Douglas fir chips of approximately one-third commercial size were digested in glass vessels under atmospheric pressure with diluted nitric acid. In order to secure adequate penetration for complete digestion, the chips were presteamed for one and one-half hours, and cold nitric acid was then added to the steamed chips. The chips were then digested for varying periods of time, with the optimum yield occuring at six hours. The nitric acid digestion was followed by a sodium hydroxide digestion with 1.5% NaOH for one hour. The resultant pulp was washed and tested.

The yield of pulp when cooked under the above conditions is low in comparison with the yields from hemlock and spruce by the usual methods. The quality of the pulp is very good. The consumption of nitric acid under optimum conditions was 21.2% on the basis of the moisture-free wood. The recovery of oxalic, formic, and acetic acids may have economic importance. Through the recovery of acids, and their re-use in multiple stages, this method of cooking involves no waste disposal problem.

The pulping of Douglas fir by the usual commercial methods has resulted in low yields of pulp with high bleach consumption. It is of interest therefore to consider other methods of cooking Douglas fir in order to overcome these difficulties. The present study was undertaken to determine the optimum conditions for the pulping of Douglas fir with nitric acid; determining the chemical characteristics of the pulp; and the consumption of nitric acid when the pulp was cooked under optimum conditions.

The use of nitric acid as a pulping agent for materials which are easily defibered has long been known, and in 1937 nitric acid was being used in Germany for producing 40 tons of beachwood pulp per day. The pulp had 98% alpha-cellulose, low ash content, and was entirely free from resin constituents *(3)*. Macormac and Cameron have pulped whole cotton stalks with 2.1% solution of nitric acid, obtaining a 41% yield of pulp with an alpha-cellulose content ranging from 87 to 89% *(4)*. However, the pulping of a coniferous wood such as Douglas fir presents other problems, and the extent of the investigations is rather limited *(1)*.

In the cooking of firwood with dilute nitric acid Routala and Sevon *(5)* found that the ligneous portion of the wood inhibited the penetration of the nitric acid, and that the wood had to be finely divided to produce pulp. They also found that nitric acid to the extent of 35 to 40% of the air dried wood was necessary, although only 30% was consumed during the cooking process.

Experimental Work

Raw Materials

Due to the previous work in this field, it was decided to start with a relatively small chip, in comparison with the commercial material. The chip finally selected was one which would pass through a screen with a one-half inch opening. No discrimination was made between the chips which were particularly resinous and those which had no resin.

The first stage of the cooking process was carried out with a dilute solution of nitric acid made by diluting technical nitric acid with tap water to the desired concentration. The second part of the cooking process was carried out with sodium hydroxide made by dissolving the required amount of technical sodium hydroxide. All reagents used in the analyses were of C.P. quality.

Laboratory Equipment for Cooking

Due to the fact that no pressure is needed in this type of pulping process, glass was used throughout the cooking procedure. The digester consisted of a 1000-cc. round bottom flask, fitted with a reflux condenser. Both stages of cooking were carried out in this flask.

Cooking Process

Seventy-five grams of air-dried wood, corresponding to 62.5 grams of moisture-free wood, and 500 cc. of solution were used for all cooks. It was found that penetration could not be effectively carried out in the range of acid concentrations used (3 to 8% of nitric acid by weight) under reasonable cooking times, and that the wood had to be pretreated in order to obtain effective penetration. Presteaming was suggested and this method proved to be effective, allowing the nitric acid to penetrate the fibers. The wood to be pulped was first placed in the flask,

* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Olympic Hotel, Seattle, Wash., Aug. 20-23, 1940.

[1] Member TAPPI, Professor of Chemical Engineering, University of Washington, Seattle, Wash.
[2] Box 541, Shelton, Wash.

and the flash was closed with a two-holed rubber stopper. A glass tube reaching to the bottom of the flask was placed through one hole, and the other hole was open to the atmosphere. Steam was introduced through the tube and allowed to vent, the condensed water being poured off at frequent intervals. Immediately after the steaming period the stopper was removed, and the cold nitric acid solution was poured into the flask. The flask was then allowed to stand for approximately 4 hours after the steaming before further heating with a Bunsen burner, in order to allow the nitric acid to penetrate the fibers. The steaming process was carried out for different times, using a concentration of 5% nitric acid by weight, and a six-hour cooking time followed with a 1.5% sodium hydroxide cook for one hour. The results of this series of cooks are shown in Table I and Fig. 1. The presteaming reached its most effective value at approximately 1.5 hours. All of the subsequent cooks were steamed for this time before further heating.

The time and the concentration needed to give the maximum yield of pulp in the ranges studied were then considered. A series of cooks were made with different times of cooking, holding the concentration of the nitric acid constant at 6% by weight. It was found that the maximum yield was reached at 6 hours. This curve when plotted showed a definite maximum with approximately 34.5% yield of pulp at six hours. Any cooking time below six hours was not enough to insure complete cooking, and any cooking time above that showed that the cellulose was being degraded. These results are shown in Table II and Fig. 2.

The effect of the nitric acid concentration upon the yield of a six-hour cook was then studied, and it was found that a concentration 6% of nitric acid gave the largest yield. The results of this series are given in Table III and Fig. 3.

Chemical Analysis of Pulp

After the determination of the optimum cooking time, a series of four cooks was made for the determination of the chemical characteristics of the pulp when cooked under the optimum conditions.

TABLE I.—YIELD OF PULP AND SCREENINGS VS. TIME OF PRESTEAMING

(All cooks cooked for 5 hours with 6% nitric acid and 1.5% sodium hydroxide for one hour.)

Cook	Presteam hours	Pulp %	Screenings %
5	0	20.2	20.4
8	0.5	28.7	7.5
9	0.75	29.1	6.0
10	1.5	30.6	5.0
10A	2	30.8	4.2

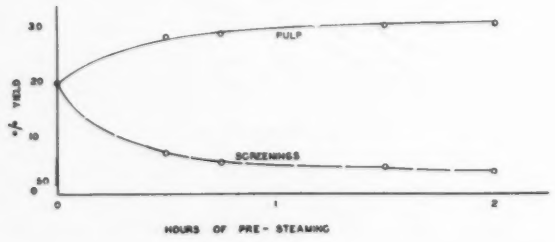

Fig. 1

Effect of Presteaming Chips (5-Hour Cook—6% HNO_3)

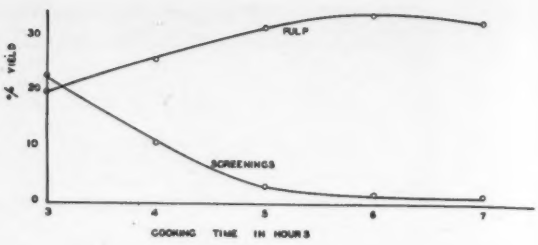

Fig. 2

Effect of Cooking Time on the Yield of 6% HNO_3 Cooks (1½ Hours Presteam)

TABLE II.—YIELD OF PULP AND SCREENINGS VS. COOKING TIME IN HOURS (6% NITRIC ACID)

Cook	Time hours	Pulp %	Screenings %
17	3	20.0	23.0
18	4	26.1	11.2
19	5	32.0	3.4
14	6	34.4	1.9
20	7	33.3	1.6
21	8	32.6	1.2

The copper number, 10% potassium hydroxide solubility, and lignin were analyzed by the methods recommended by Bray *(2)*. The alpha-cellulose was determined by a modification of the gravimetric method given by Bray. It was found that a one-gram sample for the analysis of alpha-cellulose allowed too much error in the determination, and for this reason the size of the sample was increased to three grams of air-dried pulp; and the amount of the mercerizing solution was increased to 75 cc. Aside from these two modifications the alpha-cellulose determination was the same as described by Bray. This method of analysis checked very well with some pulp of known analysis. The permanganate number of the pulp (reported as per cent chlorine consumption) was determined by the method of Wiles *(7)*. The results of the chemical analyses are shown in Table IV.

Analysis of Spent Liquor and Gas from Cooking Process

The spent liquor from the cooking process cannot

TABLE III.—YIELD VS. CONCENTRATION (6-HOUR COOK)

Cook	Nitric Acid %	Pulp %	Screenings %
11	3	8.4	46.0
12	4	20.7	28.1
13	5	30.0	7.6
14	6	34.4	1.9
15	7	31.4	2.0
16	8	29.0	1.1

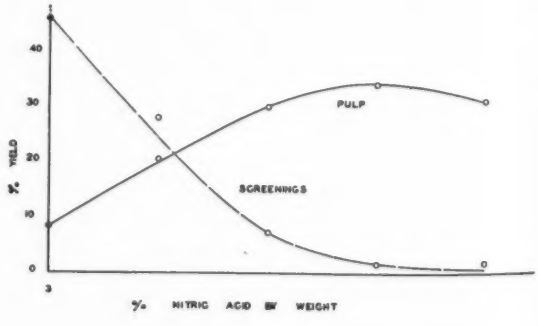

Fig. 3

Effect of Concentration on the Yield of a 6-Hour Cook (1½ Hours Presteam).

TABLE IV.—CHEMICAL ANALYSES OF FOUR COOKS
(1.5 hours presteam, 6 hours 6% nitric acid, and one hour 1.5% sodium hydroxide cook)

Cook	Pulp Yield %	Screenings %	Alpha Cellulose %	Copper Number	10% KOH Solubility %	Lignin %	Cl_2 Consumption %	HNO_3 Consumption grams
24	34.1	2.0	94.3	1.1	9.8	0.58	1.4	12.9
25	33.9	2.2	94.6	1.0	10.2	...	1.3	13.3
26	34.6	1.9	94.4	1.1	10.0	0.64	1.4	13.4
27	33.6	2.0	94.4	1.0	9.6	...	1.3	13.0
Average	34.1	2.0	94.4	1.1	9.9	...	1.4	13.2

be titrated with the usual volumetric indicators and the total acidity cannot be attributed to nitric acid. The action of the nitric acid upon the wood forms formic, oxalic, and acetic acids in appreciable amounts. In order to determine the amounts of these acids formed, the liquor was titrated conductiometrically by the method suggested by Whittemore, Reid, and Lynch *(6)*. A wiring diagram of the Wheatstone bridge and the electrodes are shown in Figs. 5 and 6. The electrodes have the advantage that they can be adjusted to any given resistance before starting the determination, since the relative conductivity of the solution is all that is important. The electrodes are made of platinum, approximately one half inch in diameter. The glass tubes are filled with mercury and the leads to the bridge are inserted in the tubes. The Wheatstone bridge was connected to the 110-volt a.c. mains through a variable voltage transformer, so that the voltage could be limited until the bridge was practically balanced.

In order to check the accuracy of this part of the experiment, a solution was made up which contained nitric, oxalic, formic, and acetic acids. This solution was then titrated with 0.0413 *N* calcium hydroxide. The end points as indicated by the conductivity curve agreed within experimental error with the calculated end points of these acids. This titration is shown in Fig. 4 and in Table V. The portion of

TABLE V.—CONDUCTIOMETRIC TITRATION OF MIXED ACIDS (5-CC. SAMPLE)

0.0413 *N* $Ca(OH)_2$ added cc.	Conductivity mhos.	0.0413 *N* $Ca(OH)_2$ added cc.	Conductivity mhos.
0	0.00658	22	0.00334
2	0.00604	23	0.00330
4	0.00552	24	0.00328
6	0.00500	25	0.00330
7	0.00480	26	0.00332
8	0.00456	27	0.00337
9	0.00428	28	0.00338
10	0.00400	29	0.00339
11	0.00379	30	0.00337
12	0.00369	31	0.00339
13	0.00359	32	0.00340
14	0.00352	33	0.00341
15	0.00348	34	0.00348
16	0.00342	35	0.00360
17	0.00338	36	0.00374
18	0.00340	37	0.00382
19	0.00337	38	0.00398
20	0.00337	39	0.00420
21	0.00336	40	0.00435

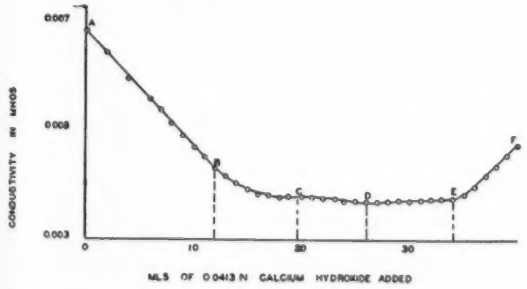

FIG. 4
Titration of Spent Cooking Liquor from Cook 24.

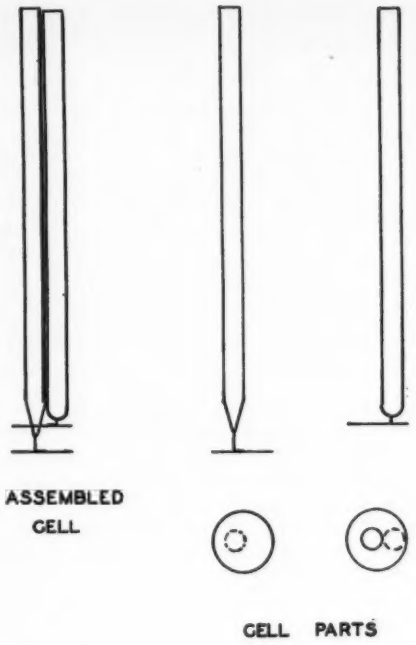

FIG. 5
Cell for Conductivity Measurements.

the curve from A to B represents the characteristic straight line titration curve of a strong acid. The part from B to C represents the first hydrogen ion of oxalic acid. The oxalic acid is quantitatively precipitated here as a calcium salt and is thus removed from the reaction. The curve from C to D represents formic acid. The portion of the curve from D to E has the ascending slope of a weak acid and represents acetic acid. The portion of the curve from E to F represents excess calcium hydroxide.

The spent liquor from the cooking process was analyzed in a similar manner. After the completion of the nitric acid cook, the liquor was poured off, and the chips were washed with a series of small washings so that the total volume of the liquor which was analyzed was approximately 800 cc. Aliquot portions of this liquor were then taken and analyzed conductiometrically, using calcium hydroxide as before. When plotted, these titrations are not as clear as the titrations of the mixed acids themselves. The curve is more irregular; it does not show the end points as sharply as the acids of known composition. However, the portion of the curve which represents nitric acid is a straight line as before, and gives a good sharp end point for the nitric acid. The titrations of the spent liquor from a control cook is shown in Table VI.

Computations made from the analysis of the spent liquor of Cooks 24 and 25 indicate that in addition to the excess nitric acid the quantities of other acids present per ton of pulp are 376 pounds of oxalic acid, 202 pounds of formic acid, and 275 pounds of acetic acid.

The nature of the gases being given off during the cooking process also indicated that nitric acid was being given off in the gaseous phase. Accordingly, the gas was mixed with air and then passed through

TABLE VI.—CODUCTIOMETRIC TITRATION OF SPENT COOKING LIQUOR FROM COOK 24

Total volume of spent liquor equals 785 cc.; size of sample equals 5 cc.

Standard $Ca(OH)_2$ added cc.	Conductivity mhos.	Standard $Ca(OH)_2$ added cc.	Conductivity mhos.
0	0.00684	22	0.00378
2	0.00642	23	0.00378
4	0.00596	24	0.00374
6	0.00560	25	0.00376
7	0.00540	26	0.00372
8	0.00518	27	0.00370
9	0.00483	28	0.00372
10	0.00471	29	0.00376
11	0.00455	30	0.00374
12	0.00432	31	0.00378
13	0.00418	32	0.00378
14	0.00404	33	0.00379
15	0.00394	34	0.00379
16	0.00384	35	0.00382
17	0.00381	36	0.00980
18	0.00380	37	0.00420
19	0.00380	38	0.00438
20	0.00380	39	0.00458
21	0.00379	40	0.00477

four wash bottles, each containing 100 cc. of 0.5 *N* sodium hydroxide. These wash bottles absorbed all the gases which were acidic in nature. Essentially, these consisted of nitric acid and carbon dioxide. The contents of these four wash bottles were then diluted to 1000 cc. and 25-cc. portions were taken and made strongly alkaline with sodium hydroxide; zinc dust was added; and the solution was distilled in a Kjeldahl apparatus until the solution was free of nitrates. The ammonia was absorbed in a known amount of standard acid, and the excess acid was back-titrated with standard sodium hydroxide. The ammonia, as indicated from the back-titration, was then calculated to nitric acid and the average of three separate cooks was taken as being representative of the conditions present. The results of the liquor and gas analyses are given in Table IV under the heading of nitric acid consumption.

Discussion of Results

The yield from this type of cook is low in comparison with the usual commercial yield, although the characteristics of the pulp indicate that the cellulose has been degraded very little. The high alpha cellulose and low lignin content indicate that the pulp is high grade. The low bleach consumption of the pulp indicates that the pulp will be easily bleached.

Since Douglas fir is relatively hard to pulp, it would be expected that the consumption of the nitric acid would be high in this type of cook. It has been reported that the nitric acid consumption for the pulping of fir wood is approximately 30% on the basis of the air-dried raw material (5). Assuming that all the nitric acid in the spent liquor and the gas is recoverable, the consumption of nitric acid for the cooks using 6% nitric acid was 21.2% on the basis of the moisture-free wood, and 62% on the basis of the pulp formed.

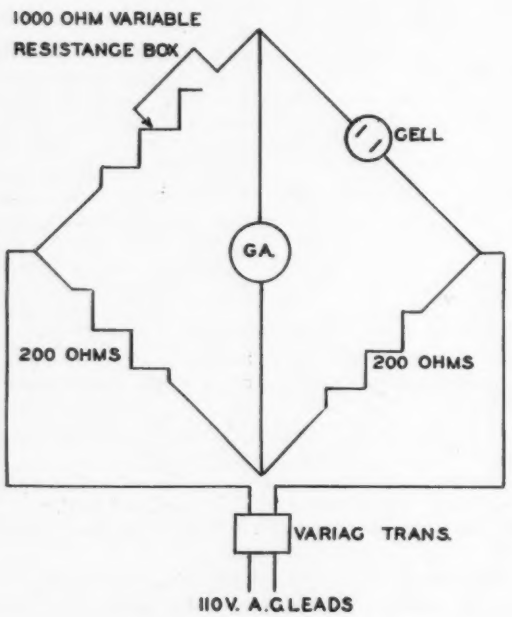

FIG. 6
Wiring Diagram for Wheatstone Bridge.

Conclusions

Douglas fir may be successfully pulped by means of a 6% solution of nitric acid boiled for six hours, followed by a one-hour cook in 1.5% sodium hydroxide.

A period of presteaming and impregnation of cold acid is necessary to obtain effective penetration of the nitric acid.

The yield of pulp when cooked under the above conditions is low in comparison with the yields of pulp from hemlock and spruce by the usual methods.

The quality of the pulp obtained from such a cooking process is very good.

The consumption of nitric acid for wood cooked under the above conditions is 21.2% on the basis of the moisture-free wood.

The recovery of oxalic, formic, and acetic acids may have economic importance.

Through the recovery of acids and their re-use in multiple stages this method of cooking involves no waste disposal problem.

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Big Pulpwood Cut Expected

WASHINGTON, D. C., September 2, 1940—It has been reported that the district along the north shore of Lake Superior will have the biggest cut of sappeeled pulpwood that has ever been made since operations began here. It is expected that between 275,000 cords and 300,000 cords of timber will be cut and exported this summer to the United States. Exports of the same product amounted to 220,000 cords last season. Most timber operators agree that since about 750,000 cords of wood is prime for cutting each year and only half of this amount of cordage can be manufactured here, that the export of timber cannot harm forest growth in any way. It has been urged however that cuts be taken from all parts of the 21,276 square miles of area which has been accessible and available this year, rather than only from the shores of Lake Superior, in order to maintain the annual maximum yield.

A Symposium on Spectrophotometry in the Pulp and Paper Industries*

Introduction

By J. L. Parsons[1]

The Inter-Society Color Council is now in its tenth year. At the present time the Council represents the greatest concentration of color interests ever brought together in this country. The aims and purposes are to stimulate and to coordinate the work being done by various societies and associations leading to the standardization, descriptions and specifications of color, and to promote the practical application of these results to the color problems arising in science, art and industry. The present membership of the Council comprises nearly a dozen member bodies and over 50 individual members.

The I.S.C.C. News Letter has continued and expanded its function of informing the membership of the work of the Council. To this has been added information concerning color from a variety of sources. Plans have been made to issue 6 News Letters during the ensuing year. Special reports of committees, technical and popular sessions of the Council, as well as regular reports of meetings, etc., are published annually. These publications are sent to all Council delegates.

Recently one of the major problems undertaken by the Council has been completed. This involved the development of a simplified method of designating colors (D. B. Judd and K. L. Kelly, "Method of designating colors", *J. Research Natl. Bur. Standards,* Sept., 1939). A primary concern of the Council during the coming year will be the exploration of applications of this method by member bodies other than those already using it for the description of drugs and chemicals. Cooperation of member bodies is needed in investigating the possibilities of uses for the ISCC-NBS method of designating colors, and TAPPI expects to take part in this investigation with special reference to appropriate uses for standard color names in the pulp and paper industry.

A survey is being made of color terms that have been adopted by groups comprising the Council. These include the fields of textiles, ceramics, paint, lighting, psychology, pulp, pharmaceuticals, and paper. Plans are under consideration for a study involving the development of a satisfactory color aptitude test, one that would be useful in indicating how good a color matcher a prospective employee might be expected to be. Member bodies have indicated preferred interest in this subject.

One manner by which the Council cooperates with member bodies is to cosponsor a technical session on subjects of mutual interest. Several of these joint sessions have already been held and the published technical papers have become important symposia on the subjects concerned.

The technical session at the 1940 Annual Meeting of the Technical Association of the Pulp and Paper Industry is sponsored jointly by the Inter-Society Color Council. The following published papers comprise this symposium.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 19-22, 1940.

[1] Chairman, TAPPI Delegates to the Inter-Society Color Council, Hammermill Paper Co., Erie, Pa.

Introductory Dialogue

By Deane B. Judd[1] and Lester C. Lewis[2]

The dialogue between Mr. Papermaker and Mr. Meter serves to introduce each paper of the symposium. Mr. Papermaker has consulted a physicist, Mr. Meter, to make a study of color control to see whether suitable instruments are being used in the mill. The scene is in the beater room, and Mr. Papermaker is explaining how they determine the amounts of dye to be added to the beater furnish to produce a match for the standard.

PAPERMAKER: As I was saying, Mr. Meter, the beater furnish nearly always contains some dye. Even if the standard is white, like this, we add blue and red dye to the bleached pulp to make the paper whiter.

METER: Dye it whiter? You can't do that. Adding dye of any color must of necessity decrease the amount of light reflected by the paper; adding dye to paper makes it darker rather than lighter.

PAPERMAKER: Well, we have our own terms which we understand, and maybe they aren't scientifically correct. All we are trying to do is to make our paper look like the standard. Here is some paper made without putting in any dye, and here is some that has been dyed to the standard color. We always say that the standard, here, is whiter than the undyed paper; but maybe we are wrong, I'll leave it to you.

METER: (somewhat puzzled after taking a second look) Hmm! The standard does look bleached. Yes, I'd almost admit that you are right, Mr. Papermaker, if it weren't for the fact that my eyes have fooled me so often. I've found that seeing is definitely *not* believing.

PAPERMAKER: My customers believe what they see. All they care about is whether the paper matches the standard. They don't mind whether the paper reflects a little more or a little less light.

METER: Still, I would like to check these papers for light reflection. The theory *can't* be wrong.

PAPERMAKER: Theories mean nothing to me, I want *facts.*

[1] U. S. National Bureau of Standards, Washington, D. C.
[2] Member TAPPI, National Bureau of Standards, Washington, D. C.

METER: I happen to have a portable reflection meter here, carry it everywhere I go, and just for my own satisfaction—(measures the two papers) there! just as I thought; the undyed sheet does reflect more daylight. The theory *gives* you the facts.

PAPERMAKER: All that proves to me is that the reflection meter won't do me any good. I still say the standard is whiter.

METER: We aren't getting anywhere this way. I wouldn't recommend this simple reflection meter for matching colors anyway; but I feel a lot better to know that it's my eye and not the theory that is wrong.

PAPERMAKER: (aside) His eye is OK, and he doesn't know it. (to Meter) But to get down to the business in hand.

METER: Yes, you were going to show me how you adjust the amounts of dye to get a match for the standard.

PAPERMAKER: It's largely a matter of mill practice, Mr. Meter. This standard is a paper we made a few months ago; we have a record of the dyes used and the number of ounces of each per thousand pounds of paper.

METER: Can you trust the dye to have the same strength as it did several months ago?

PAPERMAKER: It doesn't matter if the strength varies a little. The pulp and the filler and other ingredients of the beater furnish are not perfectly controlled anyhow. We put in about the same number of ounces as before, maybe a little on the low side, and run off a handsheet, like this. There—

METER: I can see that your handsheet doesn't match the standard, but what are you going to do next?

PAPERMAKER: Well, the trial sheet shows up not white enough, a little on the green side; so we put in some more blue and a lot more red (throwing in blue and red confetti) and run another trial sheet.

METER: And you mean to say that guesswork like that ever comes out right?

PAPERMAKER: I'm a little out of practice; haven't done this myself for several years. But wait and see how I make out. (Compares 2nd trial sheet with the standard.) There, now, as near a perfect match as you could ask for!

METER: Amazing, Mr. Papermaker! Positively amazing! But if you can adjust the color as quickly as this without any instruments, why did you call me in the first place?

PAPERMAKER: Oh! that's just the way it's *supposed* to work. Whites are usually easy. But take another example; we got stuck last week on a special goldenrod order. Customer insisted we match the exact shade of his standard. We made about a dozen trial sheets, and still didn't get it any too well. We've had cases like this before, too. Production tied up, men standing around while we fight the color; overhead going on. We can't afford to wait half a day to get the color whipped. So I thought it was about time we did something about it.

METER: Could I see the standard and your trial sheet?

PAPERMAKER: Sure, I've got them right here (spreading them out).

METER: Why! this match looks pretty good to me. What is wrong with it?

PAPERMAKER: You couldn't tell in this light, Mr. Meter; but they aren't the same color. Our trial sheet is a much better color.

METER: If it is better, why wouldn't your customer be more than satisfied? What do you mean,—better?

PAPERMAKER: I'll show you what I mean, Mr. Meter. Here in daylight they are both goldenrod, i.e., they both *look* like goldenrod. But come over by the electric light. See, the standard has turned redder; it is a sort of a peach color, it is hardly any good at all. But our trial sheet is still a pretty good goldenrod.

METER: Yes, I can see there is a slight change. That is what we call an invisible spectral difference. A spectrophotometer would show you what is the matter here.

PAPERMAKER: Spectro-fuh-what?

METER: Spectrophotometer. It measures how much light is reflected in the red part of the spectrum, how much in the orange, yellow, and so on. It photometers the sample for each part of the spectrum separately. That's why it is called a spectro-photo-meter.

PAPERMAKER: (aside) I knew there would be a *meter* in it somewhere. (to Meter) How would that help me out?

METER: Each dye or dye mixture has its characteristic spectrophotometric curve, i.e., a curve showing how the reflected light is distributed throughout the spectrum. If you get the spectrophotometric curve of the standard and of your trial sheet, you could tell with a little practice whether adjustment of the dye components will give a match holding good for daylight and lamplight both, or whether other dyes would have to be taken.

PAPERMAKER: Yes, that's what I want exactly. Once we are sure we have the right combination of dyes, and only have to vary the proportions, any color is practically as easy as white.

METER: It would put your color matching on a firm scientific foundation, Mr. Papermaker. Sometimes you might be able to substitute a cheaper dye.

PAPERMAKER: Our policy is never to cheapen the product to meet a price, Mr. Meter.

METER: But you certainly would not object to a reduction in the cost of producing the same grade of paper.

PAPERMAKER: No, of course not!

METER: So if the spectrophotometer permits you to select less expensive dyes, that would be a saving, wouldn't it?

PAPERMAKER: Well, yes. But the cost of the dye is often a fairly small item. We would rather use an expensive dye that we know *how* to use than a cheap substitute that may get us into trouble.

METER: If you knew how to use it, the cheap substitute might even turn out better. You will find the spectrophotometer a great aid in studying how to use new dyes.

PAPERMAKER: It looks as if I ought to find out about these machines. Why don't the big dye companies have them?

METER: Some of them do.

PAPERMAKER: How much do they cost? Do they get out of order all the time? How long does it take to tell what dyes are in a color? What kind do you recommend for me?

METER: One question at a time. There are a number of spectrophotometers on the market, but I couldn't recommend one for you. I don't have a sufficiently comprehensive idea of the problems that

come up in your organization, and I am not thoroughly in touch with what spectrophotometers are commercially available. But we are fortunate in having with us today, K. S. Gibson, Chief of the Colorimetry and Spectrophotometry Section of the National Bureau of Standards, and President of the Optical Society of America. He has consented to survey for us commercially available spectrophotometers and to point out the chief points of difference so that we can see what problem each is best adapted to. Dr. Gibson:

Survey of Spectrophotometers*

By Kasson S. Gibson[1]

Abstract

Recent progress in spectrophotometry in the visible spectrum has been largely along photoelectric lines. Most of the new instruments, however, have been designed for transmission measurements only, and are of little direct interest to the pulp and paper industry. Reference is made to various previous surveys of spectrophotometry, and the present paper merely brings the subject up to date, with particular emphasis on reflection measurements.

Visual spectrophotometric measurements have proved inadequate for the accurate colorimetric specification of white and near-white materials. The colors of such materials are importantly affected by small changes or differences of spectral reflection, differences that are of the order of magnitude of the uncertainties inherent in visual spectrophotometry. The photoelectric cell, on the other hand, is ideally adapted to the determination of small differences, and in apparatus designed on sound electrical and optical principles is capable of yielding spectrophotometric measurements that are both precise and accurate.

All reflection spectrophotometers measure the apparent reflectance of a material relative to the apparent reflectance of a working standard, under certain fixed conditions of illumination and observation. The concept of apparent reflectance, the importance of considering the most desirable conditions of illumination and viewing, and the question of primary and secondary standards of apparent reflectance, are accordingly briefly considered.

Introduction

Recent progress in spectrophotometry has been largely along photoelectric lines. This is particularly true in the visible spectral region in which the pulp and paper industry has the greatest interest and to which we shall devote our attention in this paper. New developments in photoelectric spectrophotometry are so frequent in fact that it is difficult to keep up with them. We must hasten to add, however, that most of the instruments are designed solely for transmission measurements and accordingly are of little direct interest and importance to those engaged in the control and measurement of the color of pulp, paper, and other reflecting materials.

Several surveys of spectrophotometry have previously been made, and it is unnecessary in the present paper to repeat what has already been covered in those publications. We refer particularly to the following:

(1) A report of the Optical Society of America Spectrophotometry Committee for 1922-23 *(1)* contains sections on nomenclature, spectrometry, photometry, visual instruments, and auxiliary methods. While out of date in some respects, this report will still serve as a good basis for those beginning a study of the subject and as a review of instruments in use up to 1925.

(2) "The use of the photoelectric cell in spectrophotometry" *(2)* is a paper which covers the period from 1900 to 1930, emphasizing particularly the errors common to spectrophotometry, which the use of the photoelectric cell in no wise eliminates.

(3) "Visual spectrophotometry" *(3)* is a discussion of the visual instruments in common use in 1934 and brings the spectrophotometry committee report *(1)* up to that date with respect to visual spectrophotometers.

[1] National Bureau of Standards, Washington, D. C.

In the present survey of spectrophotometers we purposely exclude consideration of that phase of the subject dealing primarily with what is often called "absorption spectrophotometry", as well as consideration of photographic and thermoelectric methods of spectrophotometry. Although these methods have proved invaluable in the ultraviolet and infrared regions of the spectrum, they have had relatively little use in the visible region, particularly for reflection measurements, in which we are most interested today.

Those who may wish to review the subject of absorption spectrophotometry should consult books by Twyman and Allsopp *(4)* and by Brode *(5)*. It should be noted, however, that Brode's definition of the word transmittancy is not in accord with the usual one and that his discussion of Lambert's and Beer's Laws is confusing. Reference to these same publications should be made by those interested in photographic methods of spectrophotometry, as well as to a resumé of the subject of photographic photometry by Harrison *(6)*.

Visual Methods

Visual spectrophotometers have had a long and honorable history. Based usually on sound photometric principles and having as a detector a sensitive and automatically adjustable null indicator which can in large measure recognize stray light when it sees it, the visual instruments are capable of high accuracy over considerable ranges of both spectrum and intensity.

There is very little new to report, however, about visual spectrophotometers, and reference should be made to the resumés given above for general information. Instruments are available from the Bausch and Lomb Optical Co. *(7)*, Gaertner Scientific Corp. *(8)*, and through importers from Adam Hilger Ltd. in England and Schmidt and Haensch in Germany.

It should be realized, however, that a visual instrument is incapable of adequate spectrophotometry of white and near-white materials. The colors of such materials are importantly affected by small changes or differences of spectral reflection, differences which are of the order of magnitude of the uncertainties resulting from the photometric limitations of the eye, and which in the violet and blue with the usual incandescent source are even less than these visual uncertainties. The photoelectric cell has proved so excellent an instrument for the

precise determination of small photometric differences, combined with its adequate sensitivity in the blue and violet, that the eye cannot compete with it in the spectrophotometric measurement of white and near-white materials. It seems very doubtful, in fact, that there will be any further important developments in visual spectrophotometry.

Photoelectric Spectrophotometers

The convenience, speed, precision, and spectral range of photoelectric spectrophotometers have enabled them to gain rapidly in the favor of those interested in such instruments, this in spite of considerable unwise advertising off and on during the past 10 or 15 years. The "elimination of the human eye" has been the theme-song, with variations, around which many of these advertisements have centered. But while these instruments may eliminate the 1 or 2 per cent of uncertainty ordinarily resulting from the inherent photometric limitations of the human eye, they have often introduced other errors many times larger.

The situation has improved in recent years, however, as the designers of such instruments have paid greater attention to the elimination of stray-light errors. And the ballyhoo which accompanied the commercial introduction of photoelectric spectrophotometers a few years ago was as nothing compared to that experienced in the development of the innumerable photoelectric colorimeters which have more recently appeared.

Photoelectric spectrophotometers which have been developed since 1930 are listed at the end of this paper; for earlier instruments, *see (2)*. Many of these will not be mentioned here for the reason that, as noted above, they have been designed and used solely for transmission measurements, and are accordingly not directly applicable to the measurement of spectral reflection. They are listed, however, because the methods used and the electrical principles involved are often novel and important and should be studied by anyone desirous of designing a photoelectric spectrophotometer more directly applicable to spectral reflection measurements.

So far as is known, there are but two types of photoelectric spectrophotometer now in use in this country for the measurement of spectral reflection. Both of these are recording instruments. One is the Razek-Mulder spectrophotometer *(9)*, the other is that designed by Hardy *(10, 11)* and marketed by the General Electric Co. *(12)*. Both of these have been used by manufacturers of pulp and paper *(13, 14, 15)*. It is understood that only the latter is now commercially available.

The author has had no experience with the Razek-Mulder spectrophotometer and cannot, therefore, say how satisfactory that instrument may have proved in actual practice. One of the present models of the General Electric spectrophotometer, however, has been in the Colorimetry and Spectrophotometry Section of the National Bureau of Standards for the past 3½ years and has proved of great assistance in the work of that section. Its operation was described two years ago *(16)*. The only important change in the methods of calibration there described has been the introduction and use of a working standard of reflection in place of, but calibrated in terms of, the magnesium-oxide surface.

The G. E. recording spectrophotometer has practically superseded the König-Martens visual spectrophotometer *(17)* for reflection measurements at the National Bureau of Standards. The two reasons for this are: (1) the G. E. instrument maintains adequate sensitivity over the whole visible spectrum, whereas it was difficult (though not impossible) to obtain reflection measurements below 460 mμ on the visual instrument; (2) the spectral dispersion of the energy before incidence on the sample prevents undue heating of the sample which often caused temporary or permanent change during measurement with the König-Martens equipment. These factors, combined with the freedom from stray energy produced by the second prismatic dispersion, have resulted in an instrument of great value and utility.

The two features of the G. E. instrument which have caused us inconvenience are (1) the inclusion in the measurement of part of the specular component of the reflected energy, and (2) the error in results obtained in the case of materials fluorescing strongly to incident energy in the visible spectrum *(18)*. Probably neither of these factors would cause serious trouble in the use of the instrument in the pulp and paper industries. However, the question of inclusion or exclusion of the specular component becomes of considerable importance in the case of glossy materials such as paints and vitreous enamels. Undyed pulp and paper products would not be expected to fluoresce strongly to incident energy in the range from 400 to 700 mμ because they do not absorb strongly in this region.

Apparent Reflectance

It is desired at this time to emphasize the importance of the concept of *apparent reflectance (19)*. This may be defined somewhat loosely as the reflectance which a surface appears to have when measured under any particular set of experimental conditions. *Reflectance*, itself, is defined as the ratio of total reflected to total incident energy. The reflectance of a surface may vary with the geometrical conditions of illumination, whereas the apparent reflectance of a surface may vary with the geometrical conditions of both the illumination and the viewing. The reflectance of a surface can never exceed unity, whereas the apparent reflectance of glossy and mirror-like surfaces may exceed unity, sometimes very greatly, in the direction of specular reflection.

The importance of the concept of apparent reflectance in this connection is that all spectrophotometers designed for reflection measurements measure apparent reflectance rather than reflectance. More exactly stated, they measure the apparent reflectance of the sample relative to the apparent reflectance of some selected standard.

The need of differentiating between reflectance and apparent reflectance becomes obvious to anyone who looks into the subject of gloss measurement and specification *(20)*, whether or not he uses these particular reflection terms. The concept of apparent reflectance is likewise of great importance in the colorimetric measurement and specification of many materials. Anyone attempting to formulate exact colorimetric specifications will be forced to the understanding and use of this term, or some equivalent, as surely as are those interested in gloss, even though he may ignore it in ordinary color measurement and description. And it should be obvious to everyone that the color which we wish to describe and specify is primarily that which the eye sees, resulting from

light which has been reflected from the colored object in a particular direction towards the observer.

The reason why the concept of apparent reflectance has not been given more careful consideration in the spectrophotometry of reflecting materials is threefold:

(a) The particular angular conditions of viewing and illuminating used in spectral reflection measurements, both visual and photoelectric, have been largely a matter of expediency. Diffuse illumination or diffuse viewing give much greater usable energy for measurement purposes in the case of diffusing surfaces than is obtainable from directional conditions such as, for example, illumination at 45 deg. and viewing at right angles to the surface. The spectrophotometry of diffusely reflecting materials is sufficiently difficult that research and testing laboratories have been willing to use available instruments, even if the illuminating and viewing conditions do not happen to be what they might prefer.

(b) With highly diffusing materials not possessing an image-forming surface, the spectrophotometric results obtained are often but slightly dependent on the illuminating and viewing conditions—particularly if the standard of apparent reflectance relative to which the measurements are being made has a similar geometrical distribution of reflected light as the test material. Of course, if the test material and reference standard have identical diffusing properties, the apparent reflectance of the one relative to that of the other will be wholly independent of the illuminating and viewing conditions.

(c) By the Helmholtz reciprocal relations *(19)* the results obtained may be numerically the same as would have been obtained under preferred conditions. For example, if one wishes to obtain the reflectance for a given direction of illumination, he may measure the apparent reflectance in that direction under completely diffused illumination. If he wishes the apparent reflectance for illumination at 45 deg. and viewing perpendicularly, he may, if desired, illuminate perpendicularly and view at 45 deg.

I.C.I. Conditions of Illuminating and Viewing

In 1931 the International Commission on Illumination (I.C.I.), in the same set of resolutions *(21)* in which it recommended data defining what have come to be known as the I.C.I. standard observer and coordinate system, and I.C.I. illuminants A, B, and C, recommended that in the colorimetry of reflecting materials the incident light be at 45 deg. to the surface and the angle of view be normal to the surface, except where the particular circumstances indicate that other conditions are preferable.

While the other I.C.I. recommendations have been followed in large part by those in this country interested in spectrophotometric and colorimetric measurements of reflecting materials, the I.C.I. 45-deg. normal illuminating-viewing conditions (or the equivalent 0-45 deg. conditions) have had less attention. However, certain instruments with these illuminating-viewing conditions are now in use. Some of the photoelectric reflectometers now on the market have them *(22)*, as does Dr. Judd's visual subtractive colorimeter *(23)*. So far as is known, the only spectrophotometer in this country using 45-0 deg. or 0-45 deg. illuminating-viewing conditions is the McNicholas-Hunter visual gonio-spectrophotometer *(24)*, which can also use other angles of illumination and view if desired. Two such instruments have been designed in England, a visual gonio-spectrophotometer by Boffey and Derrett-Smith *(25)* and a 45-0 deg. photoelectric spectrophotometer by Donaldson *(26)*. It is interesting to note also that the first nonrecording *(27)* and the first recording *(10)* photoelectric spectrophotometers designed for measurements on diffusely reflecting materials used these 45-0 deg. conditions.

Why have these 45-0 deg. conditions thus often been used and why were they recommended by the International Commission on Illumination? In some cases they have been used doubtless as a matter of expediency, as has been the case in most instruments using diffuse-normal or normal-diffuse conditions. In most cases, however, the 45-0 deg. conditions have probably been selected and recommended purposely, primarily to exclude the specular component of the reflected energy, because direct color comparisons are invariably made under such conditions as to exclude this component. The exact choice of angles has been arbitrary and not necessarily the best. However, it is important to note that for a great many materials these particular angles (45 deg., 0 deg.) yield values of apparent reflectance closely the same as the respective values of reflectance.

As already stated, the choice of illuminating and viewing conditions is of less importance to the paper industry than to the paint and vitreous-enamel industries, but the possible influence of such conditions on the values obtained should not be overlooked. It may be noted that certain federal and other formal specifications, such as, for example, those for toluidine red *(28)*, international orange *(29)*, medium chrome yellow *(30)*, highway yellow *(31)*, and national school bus chrome *(32)*, have been formulated on the basis of the I.C.I. standard observer, the I.C.I. coordinate system, I.C.I. illuminant C, the I.C.I. MgO reflection standard, *and* the I.C.I. 45-0 deg. illuminating-viewing conditions.

PAPERMAKER: (applauding) There's a lot to spectro—spectro—this subject. We ought to be able to use one of these instruments for more than just identification of dyes in a color. We could use it to check the match, itself.

METER: You're right.

PAPERMAKER: I think I understood about the difference between apparent reflection factor, er what was it?

METER: Apparent reflectance.

PAPERMAKER: Apparent reflectance and actual reflectance. Apparent reflectance is what we want because the eye sees from only one angle at a time.

METER: That distinction *is* important for papers that are both dark and glossy, but otherwise I doubt if you'll have to bother with it.

PAPERMAKER: Anyway the curve would be a permanent record both of the standard and of the paper supplied to match it. Maybe that would be worth keeping. One thing bothered me, though.

METER: Now is the time to speak up; I am sure that Dr. Gibson would be glad to answer any questions.

PAPERMAKER: Well, Dr. Gibson. You said none of these spectrophotometers measured on an absolute basis. They all measure relative to a standard. That puts a lot of importance into the particular standard used. If I am going to keep the curve as

a permanent record, I have got to know that the standard stays constant. What standards of apparent reflectance are used?

METER: That is a very good question. Would you care to say a few words about standards, Dr. Gibson?

Standards of Apparent Reflectance

The fundamental standard of apparent reflectance is a freshly prepared surface of magnesium oxide. This is fundamental partly in the sense that we know of nothing better to use. However, its absolute reflectance is close to unity (97 or 98 per cent) and its apparent reflectance under certain conditions—for example, the 45-0 deg. illuminating-viewing conditions—does not certainly differ from unity. Its reflectance varies by less than one per cent through the visible spectrum. These and other properties, together with the technique of preparation, have been described *(33)*.

However, a smoked magnesia surface is fragile, slightly inconstant in its reflecting properties, and of slightly uncertain reproducibility. The lack of constancy has been discovered probably by all users of the Hardy-G. E. spectrophotometer[3] and was illustrated at the meeting 2 years ago *(15)*. Because of these defects it is desirable that one have available a working standard of apparent reflectance, which shall be permanent and not subject to deterioration by ordinary use and which may be calibrated as carefully and as often as desired in terms of freshly deposited magnesium oxide.

We have found a piece of polished white glass, of the trade name of Vitrolite, suitable for this purpose. At the start, of course, we had to assume that its spectral apparent reflectance would remain constant with time. However, Mr. Keegan has now made repeated calibrations on this working standard over a period of nearly 2 years, and we believe that the data obtained indicate that the spectral apparent reflectance of the Vitrolite has remained unchanged so far. There are of course three possible variables involved in repeated measurements of this kind. First is the constancy of the working standard itself, which we are attempting to determine. Second is the instrumental uncertainty in the data. It is one thing to check to one-tenth per cent on immediately repeating a reading; it is quite a different thing to get such agreement month after month on the same sample (even with the human eye eliminated). Third is the question of reproducibility of the freshly prepared MgO surface, from the same and from different lots of magnesium.

From whatever cause, the maximum total spread of the values of apparent reflectance of Vitrolite relative to fresh MgO, at any wavelength from 400 to 750 mμ, over this period of nearly 2 years, has been 0.8 per cent of the value, the average spread being about 0.4 per cent of the value. Examination of the data leads us to believe that these small variations are due to instrumental uncertainties and lack of perfect reproducibility of the MgO surface, rather than to any change in the Vitrolite.

The method of use of this working standard is more or less obvious. The Vitrolite curve is run on each sheet of reflection curves in place of the 100 per cent curve. The comparison surface may be old MgO, $MgCO_3$, or other suitable material. The ratios of the adopted average values for the Vitrolite sample (relative to fresh MgO) to the values read from the curve give a series of corrections at the respective wavelengths which enable the values of apparent reflectance for all of the samples run on that sheet to be corrected both for deviations of the 100 per cent curve and for deviations of the comparison surface from fresh MgO. When this procedure is followed, we feel that more accurate data are obtained than if the sample had been measured relative to a fresh MgO surface.

One important precaution should be noted in the use of such a reflection standard. Because the sample is somewhat translucent, light may penetrate the sample and be lost through the edges. It is necessary, therefore, that such a working standard be calibrated relative to fresh MgO on the particular instrument on which it is to be used. Such procedure will also prevent errors which would result if the working standard were calibrated on another instrument in which a different proportion of the specularly reflected energy entered into the measurements.

[3] The author has been informed by L. C. Lewis that pressed magnesia surfaces prepared from c.p. MgO powder have had some use on the G. E. spectrophotometer. They are considered easier to prepare than the smoked surfaces and to have the same reproducibility, but the constancy of the spectral reflection of the pressed surface with time has so far as known not been investigated. The surface is formed in a shallow cup by light pressure with a smooth surface such as polished glass. It is the practice to prepare such a surface daily (the process requiring about 5 min.) and to check it against the previous day's standard kept in a dessicator while not in use. Pressed MgO surfaces of this kind have been used in the laboratories of the Mead Corp. and the Munising Paper Co.

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Additional Information

Direct reference to these papers is not made in the present paper. Most of these instruments are designed for spectral transmission measurements, but the optical and electrical principles involved may be of interest to the designers of photoelectric instruments for the measurement of spectral reflection. For papers on photoelectric spectrophotometers prior to 1931, *see (2)*, above.

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(To be continued)

Tall Oil

By H. L. Blengsli[1]

Abstract

The chief chemical by-products of the sulphite and sulphate pulp mills are tall oil, sulphate and sulphite turpentine, and lignin derivatives, with a possible production of methanol and ethanol.

Introduction

The chief crude organic by-products of the soda-, sulphate- and sulphite-wood pulping processes are: sulphate soap, sulphate turpentine, sulphite turpentine, wood alcohol, fermentable sugars, lignin, sulphate waste liquor and activated carbon.

To this list may be added a number of less important by-products of the chemical wood pulping processes, namely: acetic acid, formic acid, acetone, methyl sulphide, dimethyl disulphide, methyl mercaptan, and furfural.

Origin of the Six Major Organic By-Products

All coniferous woods contain, besides cellulose and lignin, various amounts of resins, fats, terpenes and polysaccharides. The resin in the pine wood consist of abietic acid, or some isomer of the abietic acid; the fats in pine wood consist of glycerides of oleic-, linoleic-, linolenic-, and palmitic acids; the terpenes, being neutral bodies, appear uncombined in conjunction with the resins in the wood and serve as a solvent for the latter; the sugars in the pine wood, a constituent of the so-called hemicellulose, are present as anhydrides of hexose and pentose.

In course of the chemical pulping of pine wood all of the above mentioned constituents, except the cellulose, suffer various chemical changes. These changes are in the first place dependent upon the kind of pulping process applied, and secondly, but to a lesser degree, they are dependent upon the exact conditions under which the various pulping processes are being conducted.

In the Alkaline Processes

In the alkaline pulping processes, the so-called soda- and sulphate processes, the resin acids are converted into sodium resinates, and the fats are converted into the sodium salts of the fatty acids and free glycerine. The mixed salts of the resin acids and the fatty acids, including various organic- and inorganic impurities, are called *sulphate soap*. The sulphate soap may be separated from the black liquor by partial concentration and cooling of the latter. The sulphate soap so recovered from the black liquor is a dark, ill-smelling material of practically no commercial value. Upon splitting of the sulphate soap with an acid or an acid salt, the resin acids and the fatty acids are liberated and appear in the form of a dark, disagreeable smelling oil called *tall oil*.

The terpenes are volatilized during the pulping process and are blown off from the digesters from

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time to time. Condensed and separated from the accompanying water by decantation, the crude terpenes appear as an amber, ill-smelling oil, the so-called *sulphate turpentine.* Just how many changes take place among the various terpene constituents of coniferous woods during the alkaline pulping process is not known, but that some changes take place is unquestionable.

The sugars in the wood suffer radical changes during the alkaline pulping process, and are found in the black liquor as lactones or saccharic acids, or both.

The noncellulosic constituents suffer various changes during the alkaline pulping process. Aside from the obvious fact that the lignin enters into solution, it undergoes certain decomposition processes leading to the formation of *methyl alcohol, acetic-,* and *formic acids.*

In the Acid Process

In the acid pulping process, the so-called sulphite process, the resin acids and the fats remain largely unchanged, and are to a limited extent only removed from the pulp by the sulphite liquor. The spent sulphite liquor contains some resins and fats, but will probably never be seriously considered as a source for commercial development.

The terpenes, and particularly the pinenes, suffer extensive changes during the sulphite pulping process and are largely converted into the nonterpene body, the *p*-cymene. A mixture of cymene, terpene alcohols, polyterpenes, and various oily, ill-smelling organic sulphur compounds are recovered from the sulphite cooker by condensation of the blow-off gases. This crude material is the so-called *sulphite turpentine.*

The hemicellulose, and more specifically the polysaccharides of the various hexoses present in wood are partly converted into *fermentable sugars* during the sulphite pulping process, while the polysaccharides of the pentose are converted into the nonfermentable sugar, the xylose, which in turn gives rise to the formation of some furfural.

The lignin, aside from entering into solution, suffers a partial decomposition giving rise to the formation of *methyl alcohol, acetic-,* and *formic acids.* The crude methyl alcohol, the so-called *wood alcohol,* is recovered in part from the blow-off gases of the digesters by condensation, and in part from the spent sulphite liquor by distillation. The proportions in which wood alcohol may be recovered from these two sources seems to average 1:3.

Tall Oil

Composition

The crude tall oil is a mixture of, on the average, some 45 per cent of resin, 45 per cent of fatty acids, and 10 per cent of inert, i.e., unsaponifiable matter. The composition of the crudes from different sulphate mills vary in relative proportions of resin and fatty acids, and in the relative proportions of tall oil saponifiable matter and inert matter, but the above figures will be found to be acceptable averages.

Extreme variations in the composition of crude tall oil have been reported from time to time, but the writer is quite inclined to discard such reports on the ground that either the crude in question has not been a natural tall oil, the method of analysis has not been dependable, or the chemist has not been skilled enough to carry out the analysis properly.

Disregarding the extremities in tall oil composition reported from time to time in the literature, the data in Table I are considered to represent the usual limits.

TABLE I.—COMPOSITION OF CRUDE TALL OIL FROM AMERICAN CONIFEROUS WOOD

	Min.	Max.	Ave.
Fatty acids, %	37	55	45
Resin acids, %	40	55	45
Inert matter, %	7.5	15	10

Principal Materials in Tall Oil

Resin acids in tall oil consist of abietic acid and isomers of this acid. When well refined, the resin or resin acids isolated from tall oil are substantially similar in physical and chemical properties to well refined gum rosin or wood rosin. The chief difference is that the tall oil resin has a higher melting point. As far as application of the tall oil resin is concerned, no objectionable qualities have been observed.

Fatty acids in tall oil consist of oleic, linoleic, linolenic, and some palmitic acids. The relative proportions of these acids vary with the origin of the crude tall oil, but on the whole, the linoleic acid is present in a larger quantity than the other unsaturated acids. The linolenic and the palmitic acids are probably present to the extent of 4 to 6 per cent only.

Inert matter in tall oil is less understood, except for the fact that it contains some 30 to 40 per cent of phytosterols. The balance is probably chiefly retene and decarboxylized resin acids.

Turpentine

Sulphate turpentine has up to recently been incompletely understood, except for the fact that it contained mainly α-pinene. The understanding of the composition of this material has, however, gained rapidly during the last year or so to the point that less than 5 per cent of its constituents are unaccounted for.

Sulphite turpentine consists, except for a small percentage, of a nonturpene body, the *p*-cymene. The name sulphite turpentine is, therefore, a misnomer, but since so many of naval stores products are fictitious, there is no reason to be particular in this case.

As this paper is not intended to be a discussion of the chemistry of the by-products, the above brief references as to the composition of the tall oil, the sulphate and sulphite turpentines may suffice.

Canadian Mills Production High

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 2, 1940—Several paper mills in the Fort Williams-Fort Arthur Consular Districts operated at 96.8 per cent of capacity in June, compared with 91.3 per cent in the preceding month and 58.9 per cent in June of 1939. Five of these plants reported at the end of June that they were operating at 100 per cent capacity. Paper mills at Fort Francis reported on June 6, that they were operating at 96 and 81 per cent, respectively, but it is thought likely that the two mills may have increased their operations to capacity since the date upon which their reports were made. The sulphite export business is said to be showing a marked increase.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING AUGUST 31, 1940

SUMMARY

Newsprint	7,270 rolls
Wrapping paper	453 rolls
Filter paper	21 cs.
Cellophane paper	4 cs.
Miscellaneous paper	112 cs.

NEWSPRINT

H. G. Craig Co., Inc., ——, Donnacona, 361 rolls.
International Paper Co., ——, Gatineau, 395 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 365 rolls.
H. Reeve Angel & Co., Inc., ——, Petsamo, 780 rolls.
——, ——, Liverpool, N.S., 5,369 rolls.

WRAPPING PAPER

J. B. Harris Co., Inc., ——, Petsamo, 453 rolls.

FILTER PAPER

E. H. Sargent Co., Inc., ——, Petsamo, 21 cs.

CELLOPHANE PAPER

Sherwin Bros., ——, Yokohama, 4 cs.

MISCELLANEOUS PAPER

Steiner Paper Co., ——, Yokohama, 2 cs.
Corn Exchange Bank Trust Co., ——, Yokohama, 1 cs.
Irving Trust Co., ——, Yokohama, 50 cs.
National City Bank, ——, Yokohama, 21 cs.
Japan Paper Co., ——, Kobe, 38 cs.

RAGS, BAGGINGS, ETC.

Green Textile Associates,——, Bombay, 200 bls. cotton waste.
W. Steck & Co., ——, Bombay, 430 bags old pickers.
——, ——, Yokohama, 100 bls. cotton waste.
——, ——, Fortaleza, 150 bls. old bagging.

WOOD PULP

Pulp Sales Corp., ——, Petsamo, 9,247 bls. prime strong sulphate, 1,675 tons; 777 bls. prime easy bleaching sulphite, 135 tons; 57 bls. prime bleached sulphite, 9 tons.

BOSTON IMPORTS

WEEK ENDING AUGUST 31, 1940

Elliott Addressing Machine Co., ——, Yokohama, 15 cs. paper.
——, ——, Melbourne, 39 bls. rags.
——, ——, Sydney, 7 bls. rags.

LOS ANGELES IMPORTS

WEEK ENDING AUGUST 31, 1940

——, ——, Tokio, 1 cs. writing paper.
——, ——, Powell River, 1,747 pkgs. newsprint.
——, ——, Ocean Falls, 1,029 rolls newsprint, 150 pkgs. paper stock.
——, ——, Ocean Falls, 2,141 rolls newsprint.

Foxboro Appoints Bumstead-Woolford

C. E. Sullivan, vice president and sales manager of the Foxboro Company, Foxboro, Mass., announces the appointment of Bumstead-Woolford as exclusive sales representatives for the Oregon and Washington territory. The arrangement became effective as of August 1. The Foxboro Company manufactures instruments of measurement and control, for industrial processes, and its customers in the Pacific Northwest include the great lumber and paper mills located there, as well as food packers, power plants, and companies in every other industrial field.

The firm of Bumstead-Woolford was recently formed by Dale Bumstead and O. H. Woolford, both of whom have wide acquaintance and long records of experience in fields of industrial engineering. In addition to the Foxboro line, they will represent a number of other nationally known and non-competitive industrial equipment manufacturers. The new firm has established its head office at 1411 Fourth avenue, Seattle, and has also taken over the former Foxboro Company office at Portland, at 301 Lewis Building. E. T. Stephens, an experienced instrument man, and C. H. Graham who, for the past four years has been the Foxboro sales engineer in the Portland district, have joined the Bumstead-Woolford staff.

Bumstead-Woolford will work independently but in close cooperation with The Foxboro Company's own organization on the Pacific Coast, under the direction of H. B. Brooks, Division Sales Manager, located in San Francisco.

Newfoundland Newsprint Output Up

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Sept. 2, 1940—Two newsprint mills in Newfoundland produced during April 28,233 tons of news print paper, which is above the March output. For the first four months of 1940, Newfoundland had produced 108,739 tons of newsprint, as compared with 92,879 tons for the corresponding period of 1939. Shipments of Newfoundland mills have been considerably better than a year ago. April shipments of 28,161 tons brought the total of the four months' period up to 104,165 tons, as against 60,648 tons for the first four months of 1939.

Goes With Dilts Machine Works

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., August 30, 1940—Announcement is made of the resignation of James M. Turner as paymaster at the paper mill of Taggart Brothers, Inc., to take effect September 1. He plans to enter the employ of the Dilts Machine Works at Fulton, N. Y., where he will take a responsible position in the engineering department. He is a native of Oswego County and came to this city in 1918. He will reside at Fulton.

Preliminary Program for Convention of National Paper Trade Association

Stevens Hotel, Chicago, September 23-25, 1940

The following is the preliminary program for the fall convention of the National Paper Trade Association to be held at the Stevens Hotel, Chicago, September 23-25. A feature of the convention will, as usual, be the exhibits of wrapping papers, paper products and kindred lines to be held on the exhibit floors of the hotel. Over 40 representative manufacturers in these lines have already reserved space.

Sunday, September 22

10:00 A.M. Meeting of Executive Committee of the Board of Directors — Private Dining Room No. 4.

Monday, September 23

10:00 A.M. WRAPPING PAPER DIVISION, Vice-President C. E. Roach presiding—North Ball Room. Open Discussion of Commodity lines: Wrapping Papers—E. P. Magel, Chairman; Bags—E. Wesselmann, Chairman; Tissue Lines—J. E. Roach, Chairman; Gummed Tape—C. H. Schorske, Chairman; Specialties—J. S. Addison, Chairman; Twine—C. A. Wilder, Chairman.

SPECIAL TOPICS

10:00 A.M. FINE PAPER DIVISION, Vice-President J. H. Brewer presiding—Private Dining Room No. 2. Mid-Year Survey and Distribution Trends.

2:00 P.M. INDUSTRY MEETING—North Ball Room. Open to manufacturers, guests and all members of the Trade. Informal discussion of the conditions and outlook by representative manufacturers and merchants followed by general discussion. Address of Counsel—J. K. Javits.

5:00 P.M. Wrapping Paper Merchandising Committee, W. K. Bunting, Chairman—Private Dining Room No. 4.

EVENING

Exhibits Open

Tuesday, September 24

10:00 A.M. WRAPPING DIVISION MEETING, Vice-President C. E. Roach presiding—North Ball Room. Address: "Fishing in a Bath Tub," a talk on Creative Selling—Dave Colcord, Haskell, Oberlin Co., Publishers of "Yourself" Magazine. Mid-Year Survey—G. C. Indruk, Chairman. Report of Certification Board, R. H. Ziegler, Asst. Secretary.

2:00 P.M. FINE PAPER DIVISION MEETING, Vice-President J. H. Brewer presiding—North Ball Room. Address: "Lithography—The Key to Increased Sales," W. Floyd Maxwell, Secretary, Lithographers National Association. Discussion: Writing Papers. P. A. Steihlreyer, Chairman.

4:30 P.M. Wrapping Paper Governing Committee, Vice-President C. E. Roach presiding—Private Dining Room No. 4.

8:00 P.M. Meeting of Board of Directors, President P. W. Lesh presiding—Private Dining Room No. 4.

EVENING

Exhibits Open

Wednesday, September 25

10:00 A.M. FINE PAPER DIVISION MEETING, Vice-President J. H. Brewer presiding—North Ball Room. Subjects: Book Papers, B. E. Reeves, Chairman; Cover Papers, W. W. White, Chairman.

12:00 NOON Conference of Local Secretaries and Executives with National Counsel—Private Dining Room No. 4.

2:00 P.M. Semi-Annual Meeting, President P. W. Lesh presiding—North Ball Room.

Bogota Paper Corp. Has Outing

On Saturday, August 10, the employees of Bogota Paper and Board Corporation, which operates a paper mill and a plant for the fabrication of corrugated and solid fiber shipping containers in Bogota, N. J., held an outing and picnic at Sandy Beach, Oakland, N. J.

Approximately 500 attended, including the families of the employees, and the weather was ideal. The day's program included running and swimming races for the children and the grown-ups and soft ball games for both the men and women, in addition to bathing. Refreshments were plentiful.

The outing was held under the auspices of Bogota Local No. 275 of the International Brotherhood of Pulp Sulphite and Paper Mill Workers of which Joseph Petretti, 341 River Street, Hackensack, N. J., an employee of the company, is president.

The outing committee, which is to be commended for an excellent job in arranging the program and for the complete success of the outing, consisted of T. A. Higgins, chairman; J. E. Gassenheimer, Eddie Vreeland, John Freda, Foster Dormont, and Miss Mae E. Fabris.

Representatives of the management and supervisory staff of the company, who attended, included Floyd C. Costello, vice-president and manager; Charles Burke, box shop superintendent; Rudolph Kobza, tour boss, and Clarence Nelson, master mechanic.

Officers of the union, in addition to Mr. Petretti, who attended were, Charles Fibble, vice-president; John Mac Donough, financial secretary and Harold Zimmerman, recording secretary and treasurer.

....for 15 years

this expert has spliced ORR FELTS

Only a veteran craftsman can splice a felt so the joint is as perfect and strong as the body of the felt itself. It's a difficult technique requiring long time experience.

Average experience for Orr Felt splicers is twenty years—and the perfect work that is done in this department reflects the wisdom of employing skilled workers. It is close attention, not only to splicing, but to all details of manufacture, that makes Orr Felts the finest that mills can buy.

Try Orr Felts and compare them with the ones you are now using. Scores of mills have done this and found that Orr Felts deliver the sheet to the dryers with a lower moisture content.

Orr Felt & Blanket Co.
PIQUA, OHIO

NELIO PURE GUM ROSIN and Rosin Size

Two thoroughly dependable gum rosin products made by modern scientific methods and free from the faults of ordinary gum rosin.

Investigate NELIO. In addition to its outstanding qualities of performance, its superior virtues offer economies in handling.

NELIO IS UNIFORM—Standard grades never varying in color and quality from drum to drum or shipment to shipment.

NELIO IS BRILLIANT—Assuring lighter grades of paper.

NELIO IS DRY—The turpentine content is extremely low.

NELIO IS CLEAN—Absolutely free of dirt and foreign matter. Manufactured in stainless steel equipment.

NELIO IS FULL WEIGHT—Shipped in standard, non-absorbent leak-proof metal drums, in 100-lb. net weight paper bags or in fluid state in insulated tank cars. Nelio Rosin size is shipped in liquid state in drums or tank cars.

NELIO TECHNICAL SERVICE—Consulting service by experienced paper technicians is available to paper mills on request.

Write for samples and prices.

Manufactured by

THE GLIDDEN COMPANY

Nelio-Resin Division

JACKSONVILLE FLORIDA

Sold by

E. W. COLLEDGE General Sales Ag't. Inc.

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310 South Michigan Ave.
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300 Madison Avenue

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616 Guardian Bldg.
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503 Market Street

New York Paper and Pulp Market Review

Pulp and Paper Markets Easy With No Important Changes Reported — Contract Pulp Prices For Last Quarter Expected To Remain Unchanged—Rags and Bagging Slow—Paper Stock Soft.

Office of the PAPER TRADE JOURNAL,
Wednesday, September 4, 1940.

Activity in the wholesale paper market appears to have resumed its upward trend, according to the reports of many manufacturers' representatives, jobbers, and general paper merchants during the current week.

The index of general business activity rose to 104.3 per cent for the week ended August 24, from 103.5 per cent for the preceding week, compared with 92.3 per cent for the corresponding week last year.

Paper production of 251 mills for the week ended August 24 was estimated at 89 per cent, compared with 83.3 per cent for 1939, with 80.1 per cent for 1938, with 83.3 per cent for 1937, and with 83.5 per cent for the corresponding week for 1936.

Paper board production for the week ended August 24 was 74.0 per cent, compared with 72.0 per cent for 1939, with 69.0 per cent for 1938, with 74.0 per cent for 1937, and with 76.0 per cent for the corresponding period for 1936.

General wholesale sales for July, based on reports of 2,989 firms in 36 kinds of business, as reported by the Department of Commerce, were up 10.5 per cent over July, 1939, and down 2.0 per cent from June, 1940. The gain in July, 1940, was substantially greater than for the preceding six months in 1939, which increase was 7.7 per cent.

The cost value of inventories as reported by 1,823 wholesalers at the end of July, showed an increase of 7.3 per cent over July, 1939, and 2.8 per cent above June, 1940. July was the twelfth consecutive month in which inventories increased over the corresponding period last year.

Collection in July, 1940, stood at the same ratio to accounts receivable or 74.0 per cent, as for June, 1940 and July, 1939.

The percentage changes in sales for July, from previous periods, were substantially higher; paper and paper products were 22.7 per cent higher in July, 1940 than for the like month last year, while sales for June, 1940 were 1.5 per cent lower than for the same month last year.

Sales volume in many grades of paper is reported in some quarters of the wholesale market as good, with the outlook excellent for a substantial increase in volume this month. No important change from prevailing prices on any grade of paper has been reported for the week, although some sales in tissues below representative quoted market prices now prevailing have been reported.

Mechanical Pulp

No important change in prices or demand has been reported in mechanical pulp this week. The market situation may be termed easy, with some quarters of the trade expressing the opinion that the current price level is high enough.

Chemical Pulp

The market situation in chemical wood pulp continues easy, with the price trend tending downward. Although some mills have announced last 1940 contract prices unchanged from the third quarter, no general announcement has yet been reported. Rayonier, however, has announced that its prices of dissolving and paper pulps will not be increased for the final quarter of this year.

Rags

Trading in the rag market is reported a little quiet this week. Prices hold unchanged and no important change in the market situation has been reported at this date. Prices may be termed soft, with the demand for roofing rag still reported as rather slow.

Old Rope and Bagging

Limited supplies of old Manila rope continues to maintain this market in a stable condition. Mills continue the more or less long continued policy of steadily purchasing lots of old rope. Prices hold unchanged.

Lack of foreign supplies of old bagging has created a relatively firm market situation. Mill buying continues slow, with the trade expecting a substantial improvement this month.

Old Waste Paper

Mill buving of old waste paper is reported as less active this week, with the current price situation soft. No important changes, after the several price reductions of last week, has been reported to date.

Twine

No important change in prices or demand has been reported in the twine market during the current week. Prices on all grades of hard and soft fiber twines are reported unchanging.

Pulpwood Men Posted on Pay Act

INTERNATIONAL FALLS, Minn., August 30, 1940—Contractors supplying the Minnesota and Ontario Paper Company with its pulpwood today were gathered at the mill here for the first meeting of its kind in the country to receive instruction on requirements of the Federal wage and hour law.

Summoned to the meeting by R. W. Andrews, vice president in charge of operations of the company, contractors were advised anew that all pulpwood purchased by the company must be produced in strict compliance with the Fair Labor Standards Act.

George Williams, acting supervising inspector, and James M. Miller, attorney, from the Minneapolis regional office of the Wage and Hour Division, explained the wage and hour law to the 25 contractors present and spent several hours answering their questions. Most of the inquiries had to do with the requirement that work after 42 hours in any work week be paid for at a rate of not less than time and a half. The standard work week after which overtime must be paid drops to 40 hours on October 24 next.

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TENAX FELTS

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WHAT'S YOUR PROBLEM?

The makers of TENAX FELTS can proudly say that they help paper-makers to solve today's problems today. Because they cooperate in keeping abreast of current requirements, anticipate coming demands, and can promise for TENAX FELTS a *continuing* record of accomplishment. Have you a problem in your plant? If so, consult us at once.

"Non-Users Are The Losers"

LOCKPORT FELT COMPANY
NEWFANE, N. Y.–U. S. A.

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TILE CHEST

Adapted for Use with Agi-flo Pump

The Shartle Agi-flo agitates and delivers the stock. The Kalamazoo Glazed Tile Chest gives you the advantages of low cost storage and the utmost in cleanliness.

More than 700 installations of Kalamazoo Glazed Tile Tanks now in use prove their unvarying dependability. For maximum efficiency plan to use a Kalamazoo Chest with your next Agi-flo, or any other type of agitator.

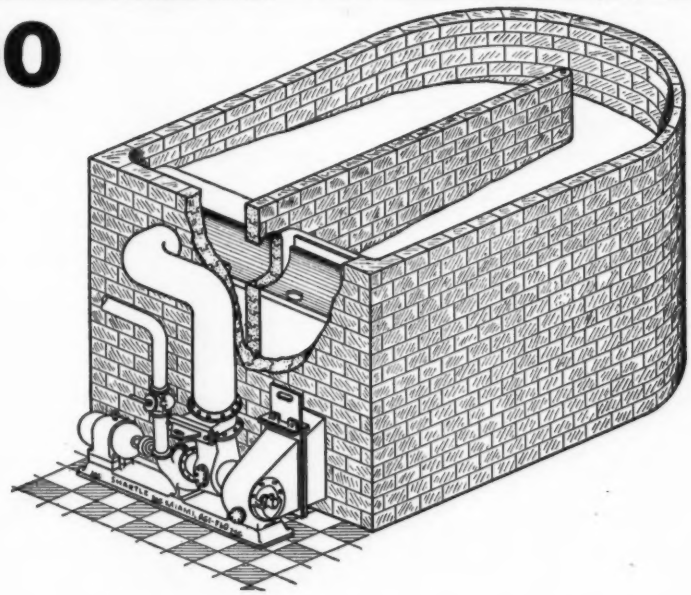


Illustration courtesy of Shartle Brothers Machine Company, manufacturers of the Shartle Agi-flo Pump.

GLAZED TILE

KALAMAZOO TANK & SILO CO.
KALAMAZOO, MICHIGAN

WOOD

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, September 4, 1940.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is currently quoted at $50 per ton, f.o.b., works. Demand reported moderate for the week.

BLEACHING POWDER—Quotations on bleaching powder are firm. Demand reported continuing steady for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are firm, with some grades a little lower for the week. Standard domestic casein, 20-30 mesh, is currently quoted at from 12 to 14 cents per pound; 80-100 mesh, at from 12½ to 14½ cents per pound. All prices in bags, car lots. Argentina casein, 20-30 mesh, is currently offered at from 11½ to 12½ cents per pound. Quotations on French casein are nominal.

CAUSTIC SODA—Quotations on caustic soda are firm and continue unchanged at prevailing market prices. Demand reported good. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Demand reported moderate at this date. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Demand reported active for the week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week with prices unchanged, "G" gum rosin is currently quoted at $1.79 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $1.70 per 100 pounds, in barrels, New York.

SALT CAKE—Prices on salt cake are firm and nominal. Shipments steady. Domestic salt cake is currently quoted at $17 per ton, in bulk; chrome cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $20 per ton on imported salt cake is nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported moderately active for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and continue unchanged at prevailing market levels. Pearl is currently quoted at $2.90 per 100 pounds; powdered starch at $3 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported satisfactory for the current week. The commercial grades are currently quoted at $1.15; iron free at $1.60 per 100 pounds. All prices in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. Quotations on imported talc are nominal.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$5.75
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.37½	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. l. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. Ll. Chip	55.00	"	57.00
White Pat. Coated	67.00	"	70.00
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10 @ $46.00	$40.25 @ $47.25
100% Rag	31.05 " 36.50	32.20 " 37.75
85% Rag	.... "	29.90 " 35.00
75% Rag	23.60 " 27.75	24.75 " 29.00
65% Rag	.... "	21.65 " 26.25
50% Rag	17.55 " 21.50	18.70 " 22.75
25% Rag	14.65 " 17.75	15.80 " 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$9.35 @ $11.50	$11.55 @ $12.75
No. 2	8.50 " 10.25	9.65 " 11.75
No. 3	8.05 " 9.25	9.20 " 11.25
No. 4	7.70 " 9.50	8.90 " 10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	$10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—	
Moist	Nominal
Dry	Nominal

(Delivered)

No. 1 Domestic and Canadian	45.00 @ 46.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	4.00
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	3.17½	"	3.75

(On Dock, Atlantic Ports)

Kraft Bleached	4.12½	"	4.00
Kraft Light & Strong	3.50	"	3.75
Kraft No. 1	3.40	"	3.60

(F. o. b. Pulp Mill)

Kraft Domestic and Canadian	3.00	"	3.25

(Delivered)

Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albanay; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.75	@	7.00
Silesias No. 1	4.60	"	4.75
New Unbleached	6.50	"	6.75
Blue Overall	4.35	"	4.50
Fancy	3.25	"	3.50
Washables	2.00	"	2.13
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.15	"	3.31

Old Rags

White, No. 1—			
Repacked	3.25	"	3.50
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	.95	"	1.00
No. 2	.80	"	.85
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal

New Rags

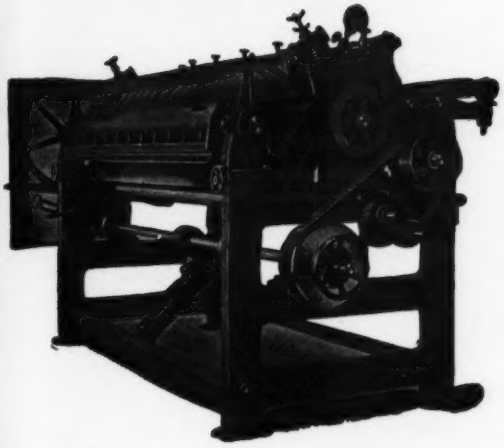
New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxford	4.00	"	4.50
New Light Prints	3.00	"	3.35

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

MODEL 28

ROLLER BEARING CUTTER



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ENGLISH FINISH SUPERCALENDERED
MACHINE FINISHED BOOK
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Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

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KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

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Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina

More than just a TRADE MARK

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 75 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.

SLITTERS AND ROLL WINDERS

In paper mills and paper mill finishing rooms Cameron Slitters and Roll Winders furnish better paper and board rolls at less cost. Write for details.

CAMERON MACHINE COMPANY
61 Poplar St. BROOKLYN, N.Y.

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4....
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	2.90
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens..	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.30	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.75	@	3.00
Domestic	2.50	"	2.75
Wool Tares, light...	2.00	"	2.25
Wool Tares, heavy..	2.12½	"	2.25
Bright Bagging	2.25	"	2.50
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.50	"	4.75
Jute Threads.....	2.62½	"	2.75
Sisal Strings.....	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	@	2.50
Soft White No. 1..	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.....	.90	"	1.00
Solid Flat Book...	.80	"	.85
Crumbled No. 1..	.70	"	.75
Ledger White Stock.	1.80	"	1.90
Ledger Stock Colored	1.30	"	1.40
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine Compressed bales..	1.50	"	1.60
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue.	.70	"	.75
Strictly Folded....	.32½	"	.35
Corrugated	.50	"	.55
No. 1 Mixed Paper...	.22½	"	.25

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.19½	@	—
White Hemp.....	.19½	"	—
Fine Polished—			
Fine India.....	.23	"	—
Unpolished—			
Box	.17	"	—
Paper Makers.....	.15½	"	—
Tube Rope.....	.16¾	"	—
Wall Paper.....	.15½	"	—
Wrapping	.18	"	—
Soft Fiber Rope...	.16¾	"	—
Cotton	.16¾	"	—

(Hard Fiber)

Medium Java.....	.20	"	—
Mex. Sisal.....	.17	"	—
Manila	.24	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1.	.06	@	.06¼
New White No. 2.	.03½	"	.04
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04
Black Silesias, soft	—	"	.02¼
New Unbleached...	.06	"	.06¼
Washable Prints...	.02¼	"	.02½
Washable, No. 1..	—	"	.01¼
Blue Overall.....	.03¾	"	.04
Cottons—According to grades—			
Washable shredding	—	"	.01
Fancy Percales....	—	"	.03
New Black Soft....	—	"	.02¼
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03½	"	.03¾
No. 2 Mixed.....	.01¾	"	.02
Corduroy	.01¼	"	.01½
New Canvas.....	.04½	"	.05
New Black Mixed.	—	"	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.50	"	2.75
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....Nominal			
Domestic No. 1...	.92½	"	.95
Domestic No. 2...	—	"	.80
Roofing Bagging..	—	"	.70

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign .....Nominal			
Domestic	2.25	@	2.75
Manila Rope.....	—	"	4.50
Sisal Rope.....	1.75	"	2.00
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	2.50	"	2.75
No. 2.....	1.10	"	1.15
Wool Tares, heavy..	3.50	"	3.70
No. 1 New Light Burlap	3.00	"	3.50
New Burlap Cuttings	2.00	"	2.25

Old Papers

(f.o.b Phila.)

Shavings—			
No. 1 Hard White	2.50	@	2.55
No. 2 Hard White	2.10	"	2.15
No. 1 Soft White	2.00	"	2.10
No. 2 Soft White	1.60	"	1.75
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.90	"	2.00
Ledger Stock, white.	1.75	"	1.80
Ledger Stock, colored	1.25	"	1.30
No. 1 Books, heavy..	.85	"	.90
Manila Cuttings.....	1.75	"	1.80
Print Manila.....	.60	"	.65
Container Manila....	.50	"	.55
Kraft Paper.....	1.50	"	1.60
No. 1 Mixed Paper..	.40	"	.45
Straw Board Chip...	.40	"	.45
Binders Board Chip..	.40	"	.45
Corrugated Board....	.70	"	.75
Overissue News.....	.75	"	.80
Old Newspapers.....	.50	"	.55

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.00
No. 1 Soft White	2.00	"	2.25
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.50	"	1.75
Overissue Ledger Stock	1.75	"	2.00
Mixed Ledgers.....	.85	"	.90
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, light..	.65	"	.75
Crumpled Stitchless Book Stock.....	.55	"	.65
Manila Env. Cuttings	1.85	"	2.00
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News..	1.40	@	1.50
No. 1 Kraft.....	1.45	"	1.50
Extra No. 1 Kraft...	1.60	"	1.90
Mixed Papers.....	.40	"	.45
Print Manila.....	.50	"	.55
Container Manila...	.60	"	.70
Old Newspapers.....	.50	"	.55
Paper Wool Strings.	.95	"	1.10
Overissue News.....	1.00	"	1.10
Box Board Chips....	.40	"	.45
Corrugated Boxes....	—	"	.55
Kraft corrugated boxes	1.20	"	1.25
New Kraft Corrugated Cuttings	1.87½	"	1.90
Screening Wrappers	.60	"	.70

Bagging

(f.o.b.Boston)

Gunny Bagging—			
Foreign	2.75	@	—
Domestic	2.25	"	2.50
Sisal Rope.....	2.25	"	2.50
Mixed Rope.....	.85	"	1.00
Transmission Rope—			
Foreign	—	"	2.40
Domestic	2.25	"	2.40
Soft Jute Rope.....	3.00	"	3.25
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.75	"	5.00
Jute Carpet Threads.	1.50	"	1.75
Gunny Bagging—			
Foreign	2.75	"	2.85
Domestic	2.25	"	2.50
Bleachery Burlap....	4.00	"	3.25
Scrap Burlap—			
Foreign	2.40	"	2.50
Domestic	2.50	"	—
Scrap Sisal.....	2.25	"	2.50
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares, Heavy..	2.40	"	2.50
New Burlap Cuttings	3.75	"	4.00
Aust. Wool Pouches..	3.00	"	3.15
Heavy baling bagging	2.25	"	2.40
Paper Mill Bagging..	1.75	"	2.00
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.04	"	.04¼
New White No. 1.	.07½	"	.07¾
New Light Flannelettes	.05	"	.05¼
Canton Flannel, Bleached	.07	"	—
Silesias No. 1	.05	"	—
New Black Silesias..	3.00	"	3.25
Red Cotton Cuttings	.04	"	.05
Soft Unbleached...	.07	"	.07½
Blue Cheviots.....	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls.....	.04¾	"	.05
New Black, Soft..	.03	"	.03¼
Khaki Cuttings.....	.03	"	—
O. D. Khaki.....	.03	"	.03¼
Corduroy	.02¾	"	.03
New Canvas.....	.06¼	"	.07¼
B. V. D. Cuttings...	.07	"	.07¼

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	2.75	"	3.75
Miscellaneous	2.40	"	2.60
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	1.50	"	2.00
Old Blue Overalls ..	1.60	"	2.00
Thirds and Blues—			
Repacked	—	"	1.25
Miscellaneous	—	"	1.00
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.00	"	1.25
No. 2.....	—	"	1.10
No. 3.....	—	"	.90

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons.....(nominal)			
Dutch Blues.....(nominal)			
New Checks and Blues(nominal)			
Old Fustians.....(nominal)			
Old Linsey Garments.(nominal)			
New Silesias.....(nominal)			

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings...	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White.	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books.....	.95	"	1.10
Blanks	1.50	"	1.60
Kraft	1.40	"	1.50
New Kraft Cuts.....	1.60	"	1.75
Overissue News.....	1.00	"	1.10
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.40	"	.50
Roofing Stocks—			
No. 1.....	.95	@	1.00
No. 2.....	.85	"	.90

Safe Handling of Chlorine

A new revised Chlorine safety chart has recently been prepared by the Mathieson Alkali Works (Inc). The chart is neatly and attractively set up in green and black with cuts of the valves used on the three standard types of Chlorine containers. The detailed schematic representation and careful labeling of the valve types greatly enhance the value of the chart as a whole.

The essential requirements in the safe handling of Liquid Chlorine are outlined in the form of twenty-four suggestions. This subject matter is subdivided under the headings: handling containers, gas masks, chlorine leaks, and first aid measures. The material, while not intended to cover every possible contingency, is considerably more complete than anything of a similar nature available, incorporating as it does new suggestions on the storage of containers, the handling of containers and valves, the stopping of leaks, and the effective use of gas masks.

The chart is representative of the wide experience of Mathieson, not only as a pioneer producer of Chlorine, but as the active leader in the development and standardization of container equipment. Copies may be obtained by interested parties addressing The Mathieson Alkali Works, Inc., 60 East 42nd street, New York, N. Y., on their business letterheads.

To Have Charge of Wyoming Sales Office

BOSTON, Mass., September 3, 1940—Montgomery Gibson is in charge of the sales office of the Wyoming Valley Paper Mill and the Groveton Papers Company, recently opened at 263 Summer street.